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ORIGINAL ARTICLES.

CONGENITAL BONY OCCLUSION OF THE POSTERIOR NARES.[1]

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UNTIL recently but little attention has been paid to bony abnormality or outgrowth as a cause of nasal stenosis. Aside from what may be called acute stenosis, from traumatism or fractures involving the skeleton of the nose, bony occlusion is rare. This statement is especially true of the anterior nasal canal, the case described by Jarvis,[2] at last year's meeting of this Association, who referred also to one observed by Delstanche, and one recently reported by Dr. F. H. Potter,[3] of Buffalo, being the only cases which have been noted.

The opinion of Mackenzie,[4] of Baltimore, that "occlusion of the posterior nares is the most common of congenital naso-pharyngeal anomalies," is probably correct, but the proportion of cases in which the obstruction consists of bone is extremely small. The number of cases of congenital post-nasal occlusion, from this cause, found by Dr. Alvin A. Hubbell, and cited in his paper read two years ago before the New York State Medical Association, was then limited to thirteen, including one of his own. Six of these were bilateral (Emmert,[5] 1851; Luschka,[6] 1859; Bitot,[7] 1876; Wilkerson,[8] 1882; Schrötter,[9] 1884; Hubbell,[10] 1886). In the remaining cases the obstruction was confined to the right side in three (Wolff,[11] quoted by Fränkel, 1876; Zaufal,[12] 1876; Pomeroy,[13] 1881); to the left in three (Brandeis,[14] 1881; Sommer,[15] 1883; Zaufal,[16] 1883); and in one case the side affected was not mentioned (Gosselin,[17] 1876).

[1] Read at the Tenth Annual Congress of the American Laryngological Association, September, 1888.
[2] Trans. Amer. Laryngological Association, 1887, p. 222.
[3] Buffalo Med. and Surg. Journal, Sept. 1888, p. 74.
[4] Arch. of Laryngology, New York, July, 1883, p. 161.
[5] Lehrbuch der Chirurgie, Stuttgart, 1853. B. ii. p. 535.
[6] Arch. für path. Anat., xviii., 1859.
[7] Gaz. Méd. de Paris, 1876, No. 36, p. 430.
[8] North Carolina Medical Journal, June, 1882, p. 305.
[9] Monatsschr. für Ohrenheilk., April, 1885, p. 97.
[10] Buffalo Med. and Surg. Journal, December, 1886.
[11] Ziemssen's Cyclopædia, vol. iv. p. 113.
[12] Präger med. Wochenschr., 1876, No. 45, p. 837.
[13] Diseases of the Ear, 1883, p. 201.
[14] Medical Record, New York, Nov. 12, 1881, p. 552.
[15] Wiener med. Presse, April, 1883, p. 476.
[16] Wiener med. Presse, April, 1885.
[17] Gaz. Méd. de Paris, 1876, No. 36, p. 430.

Congenital bony occlusion of the posterior nares may occur as a result of: (1) exostoses, or simple hypertrophy of the osseous structure of the turbinated body, middle or inferior; (2) a ridge, or exostosis, springing from the vomer; (3) an adventitious plate of bone developed from the floor, or the outer wall, of the nasal cavity. The bony impediment may vary in extent from a thin lamella or band, jutting into or bridging over the nasal passage, to a complete impervious wall. The former may occasion little or no manifest trouble, until, in after-life, it becomes the exciting cause of various local and reflex derangements. The latter is far more serious; and, when it exists on both sides, is almost of necessity fatal to the nursing infant.

The first variety (turbinated) is probably the most common, although true exostoses of the turbinated bone are rare, and may be congenital, or a result of disease. It is illustrated by several cases reported, more recently by a case operated on by Weir,[1] at the New York Hospital, who informs me that he has met with another similar case. Each of these was, in a measure, relieved by operation.

The dictum of certain authorities that congenital deflections of the bony septum are unknown may be true if restricted to its thicker posterior portion. While, therefore, it may not be proper to enumerate deflection of the septum among the causes of congenital post-nasal occlusion, thickening or exostosis of the vomer may exist to a degree sufficient to produce the second variety (septal) of nasal stenosis, especially if associated with abnormality of the turbinated bodies. In his work on *Post-nasal Catarrh*, p. 180, Woakes mentions exostosis and deviation of the septum as causing post-nasal obstruction, and refers to several cases, but does not speak of having met with congenital occlusion from these causes.

This condition, usually pathological, may be congenital. An instance of the former may be found in Case III., and of the latter in Case V., in Zuckerkandl's[2] classical work. In the former, the septum presented a bony prominence, which had formed an adhesion with a similar outgrowth from the middle turbinated body, evidently due to a morbid process. In the latter case, a very complicated one, there were several synechiæ, partly membranous and partly

[1] New York Medical Journal, March 12, 1887.
[2] Normale und path. Anatomie der Nasenhöhle, etc., 1882, p. 95.

osseous, due no doubt to faulty development, and not to a pathological process.

The third variety (palatal) of bony occlusion of the nares is of particular interest in connection with the case forming the basis of this paper. In the classification of the last-mentioned authority, no reference is made to it, and I have been able to find only two cases (Luschka, and Bitot) in which its existence was proved by post-mortem examination. Yet careful anterior and posterior rhinoscopy, as well as palpation, and the shape, situation, and character of the bony obstacle seem to establish the presence of this anomaly in several cases reported, as well as in my own case.

The precise origin of the bony wall is more or less a matter of speculation. It is quite probably a continuation of the free border of the horizontal plate of the palate bone, as described by Luschka, or an extension of its vertical plate, as maintained by Kundrat. In an interesting paper on "chronic nasal catarrh," based on the study of a large number of skulls, Harrison Allen[1] refers to one cranium in which the palatal bones sent up a delicate process "nearly half way on either side of the vomer at the posterior nares." He speaks of it as "strengthening the septum," but does not say to what extent it obstructed the choanæ. Possibly this may have been a modified or incipient form of Luschka's plate. In examining more than two thousand skulls, Sir Morell Mackenzie met with four instances of bony synechiæ, which he describes, but it does not appear whether the deformity in any case was congenital or acquired, or that this special form of bony abnormality was present.

The etiology of this condition is obscure. Spencer Watson[2] says that "it is probable that the late development of the bones in this region occasionally favors the formation of tumors and outgrowths in the nasal and orbital cavities, and that some of the malformations of the face are due to arrest of development of these parts during fœtal life." It is not difficult to understand the occurrence of asymmetry of the nasal chambers resulting from want of harmony in the development of the lateral half arches and the median structures, which enter into the formation of the face, as suggested by Allen. It is easy to conceive that this error of formation might proceed to even complete occlusion of the nares. But the deformity under consideration is not *necessarily* accompanied by obvious malformation or lack of development in other respects. It would seem to be rather an excess of development, an overgrowth of bone, resulting from hypernutrition.

A fourth cause of bony occlusion, though not strictly within the scope of this paper, deserves passing notice, namely, osteoma, either intranasal, or, much more commonly, projecting into the nasal passage from adjacent structures or cavities. This rare lesion has been described by Watson, Bornhaupt,[1] Tillmans,[2] and others, and recently a case of orbital osteoma, invading and blocking up the posterior nares, has been reported by Fenger.[3]

Several cases should be added to those already mentioned. Schötz[4] reports a case of a girl, sixteen years old, whose posterior nares were obstructed by diaphragms, probably bony, in consequence of which she had never been able to smell, or breathe freely through the nose. He expected to restore both the olfactory and the respiratory function by an operation. He mentions having found records of eight similar cases of double occlusion. Woltering[5] describes a case of right-sided bony occlusion, in a girl eighteen years old, which he treated with especially devised bone-cutting forceps, but with only partial success.

At the sixtieth meeting of German naturalists and physicians, Hopmann[6] described two original cases of complete bony occlusion of the right posterior naris. The first occurred in a patient eleven years old. An anæsthetic having been given, a passage was cleared by means of a chisel. In so doing the septum was broken, and fracture of the hard palate, with laceration of its mucous membrane, was produced. In consequence, the patient had considerable constitutional disturbance. Rubber tubes, increasing in size, were worn for about two months, and then discontinued. In three weeks the stenosis recurred, and a system of dilatation with Schroetter's laryngeal dilators was begun. Later, ivory plugs were used for nearly three months, being removed twice daily for cleansing. Nine months afterward there had been no narrowing of the passage.

In the second case the author describes the obstruction as being caused by a bony lamina from the free border of the septum, and by an osteoma springing from the floor of the nose. The patient was nineteen years old, and, as in the preceding case, the right choana only was affected. A similar operation was resorted to, and, as before, the vomer and hard palate were fractured. In this instance the cure seems to have been less tardy. A case observed by Schaeffer[7] is referred to, and notes of several cases of incomplete occlusion, partly membranous and partly osseous, are added.

In the discussion on Hopmann's paper, a case of total osseous occlusion *without symptoms* was referred

[1] The American Journal of the Medical Sciences, 1880, p. 72.
[2] Diseases of the Nose, 1875, p. 23.

[1] Arch. für klin. Chirurg., 1881, B. 26, p. 589.
[2] Arch. für klin. Chirurg., 1885, B. 32, p. 677.
[3] Journ. Amer. Med. Association, August 11, 1888.
[4] Deutsche med. Zeitung, March 3, 1887, No. 18.
[5] Monatsschr. für Ohrenheilkunde, 1886, No. 20, p. 318.
[6] Archiv für klin. Chirurg., B. xxxvii. 2, p. 235; also, Rev. mens. de laryngologie, etc., January, 1888, p. 28.
[7] Chirurg. Erfahrungen in der Rhinologie. Wiesbaden, 1885.

to by Abertüschen. Keemir reported a case in which he operated with a chisel. He then inserted a gum catheter, and afterward a silver tube. Gottstein stated that he had operated in a similar case with a dental drill, which failed to give him satisfaction.

In reporting Bitot's case to the French Academy of Medicine, Depaul[1] referred to an analogous case in his own experience. No doubt further search would discover additional examples of this interesting malformation.

Two cases of congenital, bony occlusion of the posterior nares have come under my observation, in either case the right side only being affected. One was seen but a few times, and no operation was undertaken; the other submitted to operation, and gave the following history:

G. S., female, æt. eighteen, single, consulted me in May, 1887, for enlarged tonsils, which were removed with the galvano-cautery. In the course of examination, she drew my attention to the fact that she could not breathe through her right nostril. This condition had existed as long as she could remember, but had given her no special discomfort. There was a moderate grade of chronic catarrhal rhino-pharyngitis. There was no impairment of smell, although it cannot be supposed that the right nostril shared in this function. There was no trouble in breathing through the left side of the nose, under ordinary circumstances. When the patient caught cold a discharge of watery fluid occurred from the right nostril, which at other times was entirely free from secretion. For two or three years impairment of hearing in the right ear had been observed, but it is by no means certain that hearing on that side has ever been perfect. Vision was good. The patient's mind was so occupied with her tonsils that her nose would have given her little or no uneasiness, but for the fact that she was aware of being different from other people. She was somewhat subject to headaches, which were usually explained by gastric disorder. She had no cough, and had never had any serious illness. Her general condition was not good. Her complexion was sallow, her cervical glands were enlarged, her flesh lacked firmness, and altogether she had the appearance of being poorly nourished. Her family history was good, except that a younger brother has hypertrophied tonsils.

The external contour of the nose was manifestly unsymmetrical, the right side being more prominent and "thicker," as the patient expressed it. Anterior rhinoscopy showed a very much contracted right nasal fossa, the septum being slightly deviated to the right, and presenting a ridge along the floor of the nose. The turbinated bodies seemed atrophied and their covering of mucous membrane appeared thin and dry. They were notably paler than those of the other side. A probe could be passed along the inferior meatus for two and a half inches. It traversed the middle meatus with great difficulty, on account of the deflected septum, to a similar depth, when it met with firm resistance. The left nasal cavity was unusually roomy, and the turbinated bodies, especially the lower, were large.

Posterior rhinoscopy was not easy, but after considerable training of the patient, the right choana was seen to be completely occluded by a partition, which seemed to be on a plane with the free margin of the vomer. The septum did not appear to be deflected. There was a small amount of adenoid tissue in the vault of the pharynx. The palatal arch was of average height, and nothing abnormal was seen in the oral cavity. On palpation, however, the left palate bone could be distinctly felt to extend further back by fully one-fourth of an inch than the right. By firm pressure it was possible to determine that the posterior margin of the latter was much thicker than that of its fellow. The impression given to the finger was as if the right palate bone had been bent at an obtuse angle. Pressure forward from the naso-pharynx proved the barrier to be unyielding. On pressing firmly with a large blunt probe, passed from the front along the inferior meatus, the patient complained of pain in the roof of the mouth, and during subsequent manipulations sensations were always referred to this region.

With the idea that it might be a membranous wall an attempt was made to puncture with the galvano-cautery, but it soon became evident that I had to deal with osseous tissue. No difficulty was found in perforating the obstruction with the nasal trephine attached to the electric motor. The opening thus made, about one-quarter of an inch in diameter, was subsequently enlarged by means of a revolving burr. There was not much bleeding and pain was not excessive, cocaine, in a twenty per cent. solution, having been applied anteriorly and to the naso-pharynx.

The piece of bone removed in the crown of the trephine was found to be very dense. On one side only the mucous membrane was preserved, it having been burned away anteriorly. The segment of bone measured antero-posteriorly about one-quarter of an inch at its lower, and one-eighth of an inch at its upper margin.

The after-treatment was directed to keeping the parts clean by means of a spray of Dobell's solution, and to preventing closure of the wound by daily passage of nasal bougies.

It is now more than a year since the operation, and the patient is able to breathe through her right nostril, though not always with perfect freedom. Her hearing has not improved, but her sense of smell is somewhat more acute than formerly. The question arises, Whether any other advantage has been gained? Aside from the benefit to her general health from tonic treatment, and to her pharynx following the removal of the tonsils, it must be admitted that nothing has been gained by boring a hole through her nostril. On the contrary, she is rather uncomfortable much of the time from the fact that secretions accumulate and dry in her right nostril, whereas formerly she was not annoyed in that way.

It must be confessed, therefore, that, except in the points mentioned, this patient was more com-

[1] Gaz. méd. de Paris, 1876, No. 36, p. 430. Mackenzie, Schrötter, and others refer to a case reported by "Betts." The name should be Bitot.

fortable with her nose as Nature made it than she has been since she fell a victim to science. Possibly, too, it may be said that the operation is not yet complete, since the right posterior naris is still much narrower than the left. The patient, however, is satisfied with being enabled to breathe through both nostrils, and cannot be persuaded to undergo any more drilling.

The great difficulty in these cases, namely, to keep open the newly made nasal tract, may arise from the fact that sufficient tissue has not been removed, as well as from neglect in the after-treatment. By far the best method of operating, as regards rapidity, accuracy, and thoroughness, is that with the electric trephine or drill.

Should another case of this kind offer itself to me for treatment, my plan would be, unless quite sure of the fortitude of my patient, to give an anæsthetic, and thus be allowed time enough to restore the malformed naris more nearly to its normal dimensions. Various devices have been used to obviate failure of the operation, such as the retention of flexible and of metallic tubes, and the passage of nasal bougies and dilators. In spite of all, in several cases recorded the operation has had to be many times repeated, in consequence of recurrence of obstruction.

In studying this case, two points impressed me with peculiar force. The first was the remarkable tolerance on the part of the patient of a condition involving serious interference with three important functions. In this respect the case seems to be exceptional, since the literature of the subject shows that nearly all similar cases on record had symptoms of more or less consequence, being naturally most severe in case of bilateral atresia. The amount of disturbance which would be likely to ensue from a similar *acquired* condition is in striking contrast.

The second point, a practical one, relates to the testimony gained by examination of the parts with the finger. I would not detract from the importance of rhinoscopy, but certainly, in this case at least, information was obtained by the finger which could not have been given by the mirror.

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THE CLIMATE OF COLORADO AND ITS EFFECTS.[1]

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IN the selection of a climate for a phthisical person the great desideratum is, Where may our patients find the purest and most aseptic atmosphere, combined with the other qualities suitable to their individual wants, in which they may spend the maximum of time under the open sky safely and agreeably, and still have those comforts so necessary to an invalid? Colorado affords these conditions to an extent hardly to be found elsewhere, since not only is the climate suitable for a very large class of consumptives, but from the great combination of elevated plains and mountains an invalid may find an all the year climate of infinite variety from which to select, while the large and growing commercial interests offer inducements for a permanent residence, with the very environment proven favorable to the arrest, if not cure, of this malady, phthisis. Thousands of the population of this State, who once belonged to this invalid class, but who are to-day useful, active citizens in the enjoyment of health and strength, attest the truth of these assertions.

The climate of Colorado has been so frequently and well described that it is unnecessary for me to dwell upon it in detail, but before speaking of its effects let me recall its most prominent features, those to which the favorable results are ascribed.

Situated near the centre of the United States, far from any large body of water; extending over four degrees of latitude, and seven degrees of longitude; traversed from north to south by the great Rocky Mountain range and its numerous spurs; with open plains, more elevated plateaus—or parks surrounded by mountains—and secluded valleys at varying altitudes, it offers a most surprising diversity of climate. In summer one may choose between the heated plains and cool elevated mountains, and in winter may, if desired, almost entirely escape the rigors of snow and ice, and find a balmy air and the mild open winter of the south. The portion most interesting to us, because generally proving most favorable for the treatment of phthisis, is that lying to the eastward of the Continental Divide, and consists of open plains stretching away from the abrupt foothills at an altitude of from 4000 to 8000 feet, and the mountain parks and valleys.

The whole region is characterized by rarefaction, purity, and dryness of the air with a very large proportion of clear days and an abundance of sunshine.

The atmospheric pressure varies with the locality, since the elevation is from 4000 to 8500 feet. As in all high altitudes, the air is cool, though on the treeless plains the air in summer becomes much heated by day, but owing to rapid radiation the nights are invariably cool. In winter the mercury often sinks below zero F., but the days are bright and sunny, and though the air may be cool overcoats are often a burden, and one may frequently sit with open doors and windows, and even out-of-doors, with but little extra clothing. The temperature is not equable, but the great range of temperature, which is so marked a feature of all our meteorological tables, must not be compared with the same range in a low damp atmosphere, since, as gauged by the sensations, it is far less, and in practice is seldom found to do

[1] Read before the American Climatological Association, Washington, September 19, 1888.

injury owing to the dry, stimulating quality of the air. While great and rapid changes of temperature do take place, these extreme variations are exceptional.

The purity and aseptic character of the air are decidedly greater than at low elevations, and germs find little pabulum and few places in which to thrive. There are but few large towns, and the distances between them are great; the ranch population is scanty; and the soil is dry, gravelly, and porous to a great depth, and gives forth no noxious vapors; hence there is little chance of even slight contamination of the air by disease germs.

The air is dry. The moist winds from the Pacific are cooled by their passage over the intervening mountain ranges, and the clouds have deposited the greater part of their moisture, most of them are dissipated and few cross the last and greatest range. The annual rainfall is between fifteen and sixteen inches, and the actual humidity is less than in any other portion of the Union, except in the territories of the northern part of the United States during the winter months. The returns of the United States Signal Service show that the mean relative humidity at Denver for the past four years was (100 being saturation) 52.5, 57, 55, and 51.2 respectively; while at New York for the same years, 1884, 1885, 1886, and 1887, it was 73.3, 73, 73, and 66.5 respectively. A more certain test of the dryness of the air is the actual humidity, and from the United States Signal Service charts of the year 1882, we find that during the spring of that year the air contained an average of 1.5 grains of moisture to the cubic foot, during the summer 3.5 grains, during the autumn 1.5 grains, and during the winter but 1 grain, and the reports of subsequent years show very nearly the same averages, demonstrating the atmosphere of the region about Denver to be the dryest of any portion of the United States, with the exception noted.

The greater portion of the rainfall of the year takes place during the spring and summer months, in the daily afternoon showers, rainy days or continuous rains being exceedingly rare. The snowfall during the winter is light and the snow lies upon the ground but a short time, melting and sinking into the ground rapidly under the warm rays of the sun. Fogs and mist are almost unknown.

Winds at certain seasons of the year are common, and in towns and in those portions of the State having adobe soil, frequently raise quantities of dust. They are disagreeable and annoying, but they bear with them no peculiarly injurious effects beyond mere physical discomfort when exposed to them.

The phenomenal amount of clear, pleasant weather, with bright sunshine, especially during the winter months, is the most striking feature of the climate to a newcomer. By again examining the reports of the Signal Service for Denver for the years 1884, 1885, 1886, and 1887, we learn that there were 39, 57, 40, and 40 cloudy days respectively for these years, and it is fair to presume that on very many of these cloudy days the sun shone, since other reports compiled from the same source from the observations of fifteen years, state that there were on an average of 345 sunny days each year during this period, while the yearly average of cloudy days was 56. We also find, by referring to the same records, that the mean cloudiness is less here than elsewhere in the United States, except in Arizona during the spring, and Central California during the summer. In winter the cloudiness is less than during any other portion of the year, and the proportion of clear, sunny days is consequently greater. Owing to the clearness and dryness of the atmosphere, the sun's rays lose less heat in their passage to the earth than in low, damp climates, with the result that the open air of winter on clear days, though cool, perhaps even cold, is agreeable and comfortable with light wraps while in the sun, and pleasanter than the artificially heated atmosphere within doors.

The differences between the climate of the plains and that of the mountain parks and valleys are such as usually obtain between mountains and an open country, though more pronounced. There are few places in the mountains where meteorological records have been kept, but in comparing Georgetown, situated in the mountains, some 3300 feet greater elevation than Denver, and 8500 feet above sea-level, it is found that the mean annual temperature is from seven to eight degrees lower. For the year 1887 the mean annual temperature of Denver was 50.4° F., of Georgetown, 42.3° F. The summers are decidedly cooler, the thermometer rarely registering 85° F. in the shade during the warmest days, while at night the mercury falls to, from 65° to 60° F., and often lower. The mean temperature of Denver during the summer months of 1887 was 69.1° F., of 1888, 68.4° F.; of Georgetown, for the same periods, it was 58.3° F., and 59.1° F. respectively.

The winters in the mountains are more prolonged. The temperature on sunny days is not so high, and though the mean temperature is less the mercury does not sink to so low a point during the prevalence of northerly winds. The extremes of temperature are, therefore, not so great. During the winter months of 1886 and 1887 the mean temperature of Denver was 33.5° F., of Georgetown 27.2° F.; during the winter months last past the mean was 31.6° F. at Denver, at Georgetown 26.4° F.

The rainfall is a trifle less, and the number of cloudy days is slightly greater in the mountains than on the plains. During the year ending June 30, 1888 (the only one during which such a record was kept), there were but twelve days on which the sun

did not shine in Georgetown; four of these were during the winter months. The purity of the air is, I believe, greater in the mountains than on the plains.

I have thus briefly and imperfectly sketched the general characteristics of the climate of Colorado, those to which so many consumptives owe their lives and restoration to health, and which render the mortality of this State less than that of any other, notwithstanding the numerous deaths from phthisis of persons coming within its borders when all chance of benefit is irretrievably gone, and who reach our wondrous climate only in time to die.

In Colorado we have a remarkable combination of those climatic conditions most desirable for an invalid wishing to live as much as possible out-of-doors—a dry, bracing, stimulating atmosphere of great purity, of which rarefaction is a most important element, together with a maximum of pleasant weather and an abundance of light and sunshine, especially during the winters. Not only is it possible for an invalid to spend the whole summer and fall in camp, but when winter comes and it is desirable to be under more secure shelter, the patient is still enticed out under the open sky to engage in out-door amusements and occupations by the warm sunshine and balmy air, with a soil free from mud and dampness.

There can be no uncertainty as to the desirability of such a rare climate in phthisis; the difficulty is simply in determining and eliminating those cases not suitable for treatment at high altitudes. The class of phthisical patients deriving benefit here is a very large one, but there are some who do not improve and should never be advised to test the effects of the climate of great elevations.

After several years spent in the practice of medicine near sea-level on the Atlantic Coast, and coming to Colorado an invalid, the effects of high altitudes in health and disease have been somewhat striking, and have necessarily occupied a share of my attention during my five years' residence. My observations have been made mainly in Georgetown, a town situated in a deep mountain valley 8500 feet above sea-level, and my further remarks will relate solely to the effects of this considerable elevation.

The most marked effect of the climate of this altitude is due to the rarefaction of the air, and upon persons coming from near sea-level, while often very decided, differs greatly according to individual peculiarities, some scarcely noticing the change, while others are made decidedly ill. The most noticeable effects are slightly increased frequency of inspiration, and perhaps a feeling of insufficiency of respiration, supplemented occasionally by a sigh, with quickened pulse—generally from six to eight beats per minute—and may be a more forcible beating of the heart; but with the majority of persons there is no other inconvenience than shortness of breath after some exertion, as making an ascent, and possibly a tendency to wakefulness the first night or two after arrival. Rarely, there is a feeling of giddiness, even faintness, with headache, and a light, restless sleep at night, disturbed by troubled dreams.

If the heart is sound, and the lungs all right or but slightly affected, these organs adapt themselves to the new conditions in a few days, and the newcomer notices no effects of the increased elevation, except on considerable exertion.

In fleshy persons, or those with weak heart, the rapidity of the pulse is greater, the palpitation more marked, with perhaps a feeling of faintness, while in those of full habit the color is less fresh, may be a trifle dusky, and they recover their normal condition more slowly. Persons of a nervous, excitable temperament—particularly nervous women—in addition to the symptoms referable to the heart and lungs, complain of a feeling of unrest, nervousness, and unexplained anxiety, with sleeplessness, or, perhaps, a light sleep accompanied by disagreeable dreams. Such persons, and those with a muscularly weak heart, not infrequently faint in making excursions—even in a carriage—to a slightly higher altitude, and I have known instances of fainting even at an elevation of 8500 feet, with no disease of the heart discoverable. Dryness and harshness of the skin, with tendency to chapping of the lips and hands, is the rule with all. The kidneys are less active, the urine is higher colored, and it contains a larger proportion of solids than normal at lower elevations. Even those who have resided at a high altitude for a long time notice the lightness of the air, after an absence near sea-level of but a month or two.

The effects of this great change in altitude, as described, are rarely more than temporary, and give way to a sense of general well-being, strength, and vigor, with buoyancy of spirits. The appetite is increased, the digestive processes become more active, sleep is sound, the functions of the body become more regular, and a feeling of perfect, robust health pervades the system. On the other hand, persons of a high-strung, nervous temperament often feel depressed and exhausted, and do not succeed in shaking off the languor until a lower level is reached. Those coming from malarial districts often develop transient symptoms of malaria shortly after their arrival.

I have never known hemorrhage to occur among newcomers, except in two instances. In both it took the form of hæmoptysis, and occurred in men of sedentary habits, just from their offices near sea-level, who had come to the mountains for a brief holiday. I believe both had disease of the lungs, and one had had several hemorrhages before. One within twenty-four hours, the other within forty-eight hours after arrival, took violent exercise, and went

to an altitude of from 11,000 to 12,000 feet, and feeling exhilarated, and in buoyant spirits, declined to ride, and walked up rather steep ascents. The former spat a few mouthfuls of blood after return to his hotel; the latter some thirty-six hours after his climb, and at night after a second hard day, rowing and fishing, had a very severe attack of hæmoptysis. This man I saw a few days later. For about two months he had been in failing health, had had an annoying, hacking cough, and feverishness in the evenings, and not having his attention drawn to his lungs had attributed his troubles to malaria. When I saw him he was up and about, but had a temperature of 102° F. each evening, respiration 24, pulse 110 per minute, and I found considerable infiltration from lobular pneumonia at the apex of each lung. He returned home, and died within a year.

It may readily be supposed that such novel conditions affecting so intimately the vital processes of the body may cause illness in a person who seriously overtaxes the adaptability of the system. Let me illustrate with two of the most extreme cases I have met with:

A young man, a clerk, living near sea-level, came direct to the mountains. The following morning, noticing a prominent point of rocks overhanging the town, he scrambled up the mountain side some 2000 feet, more than 10,000 feet above sea-level, to get the view, and returned to his hotel late in the afternoon, much exhausted. Shortly after he was seized with a slight rigor, excessive shortness of breath, and severe palpitation of the heart, with cool extremities. He had a slight rise of temperature, almost gasping respiration, and a very rapid pulse. He was relieved in a few hours, and was about on the following morning, though very weak.

A young Englishman, who had always lived near sea-level, and never been to a greater elevation than 400 feet, came direct to Colorado, to an altitude of over 9000 feet. Being accustomed to active exercise, he spent entire days on foot on the mountains, and in visiting mines. After some two weeks of great and unusual exertion, he was seized with a slight febrile action, accompanied by a dry, hacking cough, shortness of breath, pain in the intercostal muscles, and palpitation of the heart, with soreness of the muscles, especially of the chest. The fever practically ceased in twenty-four hours, but the oppression of the chest, and intercostal pain, together with an amount of prostration out of proportion to the slightness of the attack, continued for ten days longer, but were promptly relieved by a short stay at a lower elevation.

What is the effect of residence at this altitude? The average expansion of the chest, as found by examinations for insurance, is greater than commonly found elsewhere, and in children the chest is proportionately larger and well developed. The skin is usually dry, though the insensible perspiration is probably greater than at lower levels in damp climates, and excessive perspiration occurs only after considerable active exercise. The urine is commonly of higher specific gravity than mentioned as normal, from 1024 to 1030.

The population of the mountains, as a whole, I have found to be an unusually healthy one, notwithstanding the fact that a large proportion of the men of this locality work in the silver mines, in bad air, in places dripping with water, and much exposed to cold draughts. The almost entire absence of bowel troubles, the infrequency of serious organic disease, of the more dangerous forms of continued fever, and freedom from all malarial diseases, give as a result a comparatively small amount of sickness. Children are especially healthy.

Occasionally cases of general debility with loss of nervous tone and sometimes with slight anæmia are met among those who have lived continuously in the mountains for a series of years, and though it is often difficult to determine the precise share the altitude may have in producing the undefined symptoms complained of, yet it is found in practice that a change to some lower elevation has a most marked and prompt remedial effect.

The trouble most frequently complained of is so-called biliousness, generally in miners, the result of continued exposure and wet, and is a slight stomach disorder. If the attack is somewhat sharp, there are general malaise and some febrile action, with headache, backache, pain in the limbs, soreness of the muscles, and heavily coated tongue. In more severe attacks the above symptoms are intensified and preceded by rigors, perhaps a slight chill; the temperature varies from 102° to 104° F.; coated tongue, nausea, and vomiting of bile, distress in the epigastric region, with tenderness of the liver, sluggish bowels and dark, offensive stools. These symptoms are usually controlled with readiness if given prompt attention, and the patient is about again in from two or three to ten days. The disease may last a week or ten days in mild form, but shows no uniformity as to duration. It is seldom or never remittent, and if a relapse does occur it does so from a definite, accidental cause.

Such febrile attacks are called mountain fever. It is a mild bilious fever with hepatic congestion.

I have known cases of fever to commence as above described and last four weeks, with no single symptom of typhoid, the temperature varying from 102° to 105° F. a great part of the time, often as high or even higher in the morning than in the evening, without delirium, tongue moist, appetite fair, even good, bowels regular and natural, but little emaciation, and the patient asking each day to be allowed to sit up, believing himself free from fever. Prolonged attacks of fever, however, usually show a few symptoms of typhoid during their course.

Typhoid fever, as I have seen it in the mountains,

has been, as a rule, very mild, lasting from two to three weeks. Commonly the only indications of a typhoid element are a few rose-colored spots about the commencement of the second week, and a transient relaxation of the bowels, with slight and temporary tenderness over the right iliac fossa. The tongue is moist, the appetite fair, and the patient often feels so well that some persuasion is necessary to keep him in bed.

I have met with two cases which proved rapidly fatal. In these the onset was unusually rapid and sharp; dry tongue and ataxic symptoms developed very early, and the fever ran very high. I have seen but few cases with ataxic symptoms and those referable to the nervous system, but these have impressed me with the belief that the occurrence of these symptoms is of far graver import than at lower altitudes.

I have never observed any material difference in the course of the exanthemata. In diphtheria death from sudden heart failure appears more common.

Pneumonia is supposed to be both common and very fatal at high altitudes. I am not of that opinion without qualification, and my experience does not lead me to believe it is of more frequent occurrence among those who are acclimated than at lower levels; indeed, I am inclined to think it less so, and under similar conditions of prudent, careful nursing, no more fatal. I have found it to be neither common nor fatal among women and children. It might be supposed that, owing to the rarefaction of the air, the diminished amount of oxygen it contains, and the increased labor thrown upon the lungs, that the proportion of deaths would be greater; but, to offset this, the air is of great purity and the health of the patient before the attack has generally been so robust that the disease finds the subject well fortified for withstanding the exhausting tendency of an acute disease. Pneumonia is, however, very fatal among those who, having been but a short time in the mountains, have been working hard, subjected to exposure under such unusual climatic conditions, in wet mines or in storms on the mountain sides at great elevations, and are seized with the disease, especially if saturated with alcohol. Living in comfortless, isolated cabins, as many men do, they have no conveniences when sick, and only the very indifferent nursing of comrades or comparative strangers, or of their families under poor surroundings. With these unfavorable conditions the disease is apt to assume a very acute and violent form, and often, when convalescent, they catch an additional cold, when the fatal result they would ordinarily have escaped promptly ensues. These circumstances would be attended by a large mortality in any climate, and here it should not properly be ascribed to the altitude but to the peculiar, rough mode of life and lack of care which were so common in the earlier history of the State, and even now in many frontier settlements and mining camps. These facts have given rise to the general impression of the fatality of this disease at high altitudes without a careful analysis of the causes contributing to the result. In acute lobar pneumonia, for the extent of lung involved, the respiration is from six to eight higher per minute. Hepatization takes place rapidly and the expectoration is usually of a fresher color than at lower elevations.

Acute plastic pleurisy is not infrequently met with, but it has not been my fortune to see a single case of pleurisy, with effusion, during my stay in the mountains. I have had one case of empyema, this as a sequel to pleuro-pneumonia. Bronchitis, in the form of ordinary "colds," is not more common than elsewhere, and seldom proves more than a temporary indisposition and does not tend to linger and become chronic.

Migraine and neuralgias are probably not more common than at sea-level. Chorea among children is rather common. Epilepsy I have but rarely met with, and have not known of the development of a single case. Enlargement of the thyroid gland among women is more frequently met with than in other places, but it never attains any great size. Exophthalmic goitre I have observed several times. Nasal and pharyngeal catarrhs are common and troublesome. Acute and follicular tonsillitis occur as elsewhere. Bowel troubles are, as I have stated, unusual, and are almost invariably promptly controlled by simple remedies. Children coming to the mountains with summer complaint usually recover quickly with little else than careful regulation of the diet. Dysenteric diarrhœas are very uncommon. Sporadic dysentery rarely occurs, and then in a subacute form. Acute dysentery with fever has come to my notice but once, and this was the result of fecal accumulation in a case of chronic constipation, and the patient had had several similar attacks before coming to Colorado. Those cases of chronic Bright's disease I have met with have been difficult to manage, though several cases of the acute form have yielded readily to treatment.

Diseases of the heart give trouble early in their course and grow worse very rapidly. To this I do not recall an exception. I have carefully watched the development and progress of several cases of valvular disease—aortic and mitral—and have noted hypertrophy, but no positive dilatation has taken place, except, possibly, in a case now under observation, it is as yet in its early stage, and has given no clear evidence of its presence. Those with fatty heart, or in whom the heart muscle is weak, are soon obliged to go to a lower altitude.

Acute diseases of an inflammatory character are more acute, as a rule, at high altitudes, and prompt measures are more necessary, while full recovery of

strength from these, and particularly from fevers, is apt to be slow, and is materially hastened by a short stay at a lower elevation.

Owing to the purity of the air and its freedom from germs and microbes, and the activity of the assimilative processes at this altitude, wounds heal by first intention more surely and with less strict attention to antisepsis than at sea level. Cases of compound fracture and extensive wounds act more kindly, granulate and cicatrize more rapidly, and suppuration is far more limited than elsewhere, even when no particular attention is paid to the thorough purification and cleansing of the parts. Traumatic fever is very slight or altogether absent. These facts are particularly apparent to a surgeon when recently from a low damp atmosphere.

A few medicines act peculiarly at high altitudes. Quinine is more active, and it is impossible to prescribe such doses as are given in the east without causing distressing symptoms of poisoning. Many women and children cannot take even the smallest quantity without distress, and I have had adults complain of cerebral excitement, nervousness, and cinchonism, after taking two doses, of two grains each, of the bisulphate at an interval of three hours. I have seen several persons wildly delirious, in whom the drug had been pushed, and the cause of the delirium not recognized. I ordinarily use larger doses of cerebral sedatives, as bromides, and smaller doses of aconite than I was accustomed to use at sea level. Veratrum viride I find comparatively little use for. Digitalis, on the other hand, may be prescribed more freely, especially in those acute diseases tending to enfeeble the heart.

The therapy of the climate of Colorado is scarcely within the scope of this paper and has been so well presented to you by the gentlemen from Colorado who have preceded me, that I will not dwell upon this portion of the subject further than to call attention to the fact, illustrated very many times in my experience, that cases of phthisis frequently do remarkably well in the mountains, at great elevations, when they have failed to improve on the plains, and had all but lost hope of deriving any benefit from that, to them, *dernier ressort*—the climate of Colorado. So many such cases have come under my observation that I am fully convinced that the timidity of advising patients to go the mountains of Colorado is largely unwarranted. Certain precautions as to clothing, exercise, and habits of life must be attended to as elsewhere in high altitudes, and these are particularly necessary in the mountains. Further, in order to reap the full benefit, the rule applicable to all parts of Colorado must be followed —*i. e.*, the stay must not be intermittent, but prolonged, until the improvement may be relied upon as more than temporary, and until the reparative process in the lungs is well advanced. Especially is this true for cases which have progressed beyond the first stage. Patients almost invariably gain the most during the winter months.

In considering the benefits consumptives derive from a residence in elevated regions, we naturally ask, To what peculiar feature may we ascribe its good effects, the purity, the rarefaction, or the dryness of the air? While I am inclined to answer that the beneficial effects are due to a happy combination of the qualities described added to the possibility of spending a large portion of the time in the open air, and believing that the importance of purity of the atmosphere cannot be over-estimated, I am of the opinion that the most potent factor is the rarefaction of the air. All portions of the lungs are fully expanded, increasing the activity of the capillary circulation of the lung and bathing the diseased parts with a dry pure air, favoring the absorption of the morbid deposits, while at the same time the stimulating qualities of the atmosphere, by improving nutrition, call into action the reserve powers of the constitution and restore the tone of the system, enabling it to cope successfully with the local disease.

There are one or two very simple rules which all consumptives coming to high altitudes should understand and observe, since, because of the unusual characteristics of the climate, they are so important that neglect of them will retard recovery, and in advanced cases may destroy the slight chance still remaining to the invalid of receiving benefit from the change, and lead to a fatal result.

1. The approach to elevated regions should be gradual and by easy stages, not in these days of Pullman coaches, to spare fatigue, but in advanced cases with limited lung space, and in those with fever and considerable activity of the disease, to avoid over-taxing the capacity of the lung to adapt itself to the rarefied atmosphere. For the same reason the invalid should, for a time after arrival, either take very moderate exercise or none at all.

2. The residence should be continuous and prolonged.

I am confident, were the first of these rules more generally followed, we should hear far less of the ill effects of high altitudes and be able to note a larger percentage of advanced cases as improved; and if the second was faithfully observed, there would be more cures and fewer relapses.

WATERMELON-SEED IN THE RIGHT BRONCHUS. OPERATION. RECOVERY.

BY GREGORY ACKERMANN, M.D.,
OF WHEELING, W. VA.

Carrie K., two years old, of Matamoras, Ohio, was brought to Wheeling for treatment, having swallowed a watermelon-seed which lodged in the windpipe four days previously.

The child was bright, playful, and not suffering much inconvenience from the foreign body, except that her voice was husky and she had an occasional violent paroxysm of croupy coughing, attended with attacks of suffocation. On auscultation there was found delayed inspiration over the right lung, the vesicular murmur assuming a cog-wheel-like character. This was apparently produced by the partial closure of the right bronchus.

Emetics had been tried in vain, as well as shaking and thumping the child, while holding her head downward; so the operation of tracheotomy was decided on as the only means of relief.

After the patient was removed to the Wheeling Hospital, with the kind assistance of Drs. Dickey, Schwynn, and Hildreth, I performed, under chloroform anæsthesia, inferior tracheotomy (below the thyroid isthmus). The fat neck of the child, and the numerous vessels in this locality, necessitated a careful and slow dissection down to the trachea. Making an incision about three-quarters of an inch in length, and introducing four loop ligatures through the cartilage, the aperture was held open by an assistant, while I held the child heels up, shaking it and causing expulsive coughing by irritating the trachea with a small feather. These efforts were futile, however, and recourse was had to a pair of curved slender forceps. The child lying on its back, the forceps were gently introduced through the incision, down to the extreme end of the right bronchus, where the seed, which had firmly lodged there, could be just grasped by its end and easily withdrawn. It was an ordinary sized watermelon-seed, somewhat swollen by the secretions.

The tracheal incision was closed by four sutures, and the external tissues drawn together by several sutures, a small drainage tube being inserted into the lower angle of the wound. The dressing consisted of iodoform plentifully sprinkled over the wound, and several layers of carbolated gauze loosely bandaged around the neck.

The little patient recovered quickly from the operation, and was apparently much relieved of the first mentioned symptoms. There was no elevation of temperature, the wound healed by granulations, and in ten days the child was taken home by its happy mother, perfectly well.

WHEELING, W. VA., September 15, 1888.

A CASE OF ATRESIA ANI URETHRALIS. OPERATION WITH RELIEF.[1]

BY A. T. CABOT, A.M., M.D.,
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THE case I have to report is one of imperforate anus, in which the rectum discharged its contents entirely through the urethra, and in which, finally, by operation, this condition was successfully corrected.

Before proceeding to the account of the case, it may be interesting to consider briefly the development of the organs involved in the deformity, and to see how the separation of the rectum from the urinary passages is accomplished during fœtal life.

In Fig. 1, which is a diagram after Kölliker, we have a representation of the manner in which the allantois folds and divides itself to form the urinary organs and the rectum. At R we see the first indi-

FIG. 1.

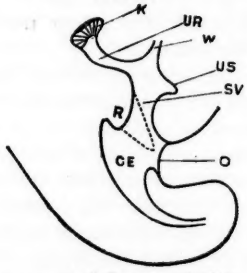

Diagram of arrangement of allantois. K. Kidney. U R. Ureter. W. Wolffian duct. U S. Urachus. S V. Sinus urogenitalis. C E. Cloaca from which rectum is formed. R. Fold from which the perineum is formed. O. Common orifice of urogenital tract and rectum.

cations of the perineum, and the dotted lines show how this fold, as the further development goes on, pushes itself down between the rectum and the sinus urogenitalis to form finally a complete separation between them. Figs. 2 and 3 give some idea of the

FIG. 2. FIG. 3.

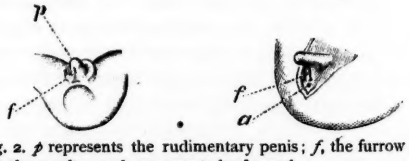

Fig. 2. *p* represents the rudimentary penis; *f*, the furrow from which the urethra and anus are to be formed.

Fig. 3 shows the commencing separation of the urethra from the rectum; *f*, rudimentary urethra; *a*, anal orifice.

way in which the perineum comes down and divides the external opening into an anus behind and a urethra in front. And they also indicate how the outer portion of the urethra, with the penis that encloses it, is formed by a folding of the external surface. A failure in the formation of any part of this perineal septum leaves an opening between that part of the rectum and the urethra or bladder. In woman the communication would be with the vagina.

Accordingly, Förster, in his extremely thorough monograph on malformations, makes three separate forms of this deformity. 1. Atresia ani urethralis. 2. Atresia ani vesicalis. 3. Atresia ani vaginalis.

[1] Read before the Association of Genito-urinary Surgeons, Washington, September, 1888.

In all of these the anus is imperforate, and the lower end of the rectum opens into the urethra, bladder, or vagina. The opening into the vagina may be quite large and easily provide for the adequate discharge of the feces. On the other hand, however, the communication with the urethra or bladder is always by an extremely small fistulous track, which is too narrow for the sufficient escape of the contents of the bowel, and death is, therefore, a necessary result of this deformity, if not interfered with.

The fistula, when it enters the bladder, does so at the fundus. It may enter the urethra at any point in its course. Förster figures a case in which the rectum ended as a pouch, and from it a long narrow passage led forward close under the skin of the scrotum and along the under surface of the penis to open into the urethra close to the meatus. Ordinarily, however, the communication with the urethra is in the deep part, at or just in front of the membranous portion.

When a case of imperforate anus emptying through the urethra presents itself for operation, it is naturally of first importance to determine where the rectum enters the urinary passages. If this opening is into the urethra, we may hope to find the rectal pouch low down, where it is accessible to operation, and where it is less likely to be surrounded by peritoneum. To decide this point, the fecal and urinary discharges should be watched carefully. If they come separately and not mixed, it may be concluded that the communication is with the urethra in front of the compressor urethræ muscle; while if they come together, intimately mingled, it is evident that they must have become so mixed in the bladder, where they met and were stirred together before they were voided. We can also judge from the ease of the fecal discharges, and from their amount, something as to the size of the fistulous passage.

In the performance of the operation, the first difficulty is to find the end of the bowel. As its contents have been escaping through the urinary passages the rectal pouch does not form a bulging tumor as in an ordinary case of imperforate anus, but may be, as it was in the case to be reported, quite empty. Fortunately, we may be pretty sure that the cloaca lies in the middle line, and that in order to reach the urethra it must come down over the prostate. Acting upon this consideration the surgeon should have a staff in the urethra as a guide, and should take the greatest pains to adhere to the middle line in his dissection, which should be carried back toward the apex of the prostate.

The patient whose case forms the subject of this paper, was sent to me in February, 1888, by Dr. H. S. B. Smith, of Middleborough, Mass. The little boy was then five weeks old, and was a fairly well-nourished child. He showed no other deformity than the one we have to describe.

At the proper site for the anus there was only a slight dimple of the skin, perhaps one-half an inch deep, and not showing, even in its deepest part, any sign of a mucous membrane. If the finger was introduced into this depression, its presence excited a muscular contraction around it which showed the evident existence of a sphincter at that point. During the five weeks of life, all of the feces had passed through the urethra, and, as they had been always fluid, the child had suffered no apparent inconvenience from this abnormal method of defecation.

By careful watching it was found that the urine and feces never came intimately mixed, but that, if they were passed at the same time, there was first a jet of urine then an escape of feces, followed, perhaps finally, by a gush of clear urine again. Also, at times, the urine was passed without any appearance of fecal matter, or the feces appeared without any passage of urine. It was plain from this way in which urine and feces came separately that the bowel must enter the urethra in front of the cut-off muscle, and it was decided to cut down and try to establish an opening into the rectum just behind this point. This operation was done March 7, 1888.

A sound was placed in the urethra to serve as a landmark, and with the patient in the lithotomy position, an incision was made along the raphe and through the dimple which marked the proper site for the anus. After a rather deep dissection close to the prostate, the rectum was found and opened by a longitudinal incision about three-fourths of an inch in length. The edges of this opening were stitched down to the anal depression above described, care being taken to attach it within that part surrounded by the sphincter muscle. The portion of the incision behind the anus was brought together with sutures, the part in front being left open for drainage, in case any urine should leak through the wound.

Fecal matter escaped freely during the operation, and, three hours later, there was a large evacuation of liquid feces through the newly opened anus. For thirteen days all of the feces came by the anus and all of the urine by the urethra. On the thirteenth day a little gas was seen to pass the urethra, and an examination of the anus showed that the parts were almost wholly healed, and that the opening into the bowel was beginning to contract somewhat. This was easily stretched with the finger, and from this time dilatation of it was practised every second day.

Except for the rare escape of a trace of feces by the urethra, and the occasional appearance of a few drops of urine by the anus, everything now went well. After a few days, the mother was taught how to dilate the anal opening, and with instructions to do so every day or two, she was allowed to take the child home.

I heard from them again on August 6th (five months after the operation). Dr. Smith then wrote me as follows: "The anus now seems in quite a natural condition. There is much less resistance to the introduction of the finger than there was three

months ago. Most of the urine passes normally, but a little is seen now and then to pass the anus. There is an occasional stain of fecal matter by the urethra, but only when the child is constipated."

The mother writes that the baby is well and strong, and has not had a day of sickness through the summer.

Whether the communication between the rectum and urethra will finally close spontaneously cannot yet be told. It causes now no inconvenience, and can probably be closed by operation when the child is stronger and the parts larger.

TWO CASES OF GUNSHOT WOUND OF THE ABDOMEN, ILLUSTRATING THE USE OF RECTAL INSUFFLATION WITH HYDROGEN GAS AS A DIAGNOSTIC MEASURE.

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CASE I.—J. J., sixteen years of age, was out hunting with some companions on Sunday, September 9, 1888, one of whom accidentally discharged his 22-calibre rifle at a distance of about one hundred and fifty feet, the bullet striking the patient in the abdomen. The injury caused but little pain, and immediately after the accident the patient walked about forty yards to a farm-house, where he was placed in bed. From there he was conveyed on a cot, in a farmer's wagon, to the Milwaukee Hospital, some six miles distant. The accident occurred about noon, and he arrived at the hospital at 3 P.M.

Examination.—Boy complains of considerable pain in the abdomen; pulse 80 and soft; his general appearance indicates no serious injury. On undressing him, a bullet wound, with omentum protruding, was found two inches to the right of the middle line, and on a level with the anterior superior spine of the ileum. Left iliac region dull on percussion; and in right, a cracked-pot sound was elicited on percussion. A rectal enema was administered, and was followed by a free fecal discharge, without admixture of blood. (On washing the feces afterward the bullet was found.)

Operation.—Ether, as an anæsthetic; thorough disinfection of abdominal wall; rectal insufflation of hydrogen gas, followed by the escape of bubbles of the gas, within a few seconds, at the wound of entrance, into which had been placed a hæmostatic forceps, the blades separated so as to render the canal patent. The gas was lighted, and after thorough cauterization of the wound by the flame, the flame was extinguished by the application of a wet sponge.

Laparotomy by median incision, eight inches in length, from pubes upward. About a pint of fluid blood in the peritoneal cavity, and hemorrhage continuing from the mesenteric veins at two points of perforation on the mesenteric side of the bowel, and to a less extent from perforations of the mesentery; arrested by ligating *en masse*. Within a distance of four feet, near the middle of the ileum, were found ten perforations, two of which were at the mesenteric border; also four perforations of the mesentery. Another perforation of the bowel was found within four inches of the ileo-cæcal valve on the convex side of the intestine, making so far eleven in all. All were closed by Czerny-Lembert sutures. At two points the perforations were so close together that it was found necessary to invert half the circumference of the bowel on the convex side, thus producing considerable narrowing of its lumen.

Two hours had been consumed in arresting the hemorrhage and closing the eleven perforations, and the patient at this time had become pulseless, and yet it was deemed absolutely necessary to determine beyond all doubt if any more perforations existed by repeating the rectal insufflation of hydrogen gas. On repeating this test it was found that gas escaped freely from the pelvic cavity, without reaching the ileo-cæcal region, showing that at least one more perforation was below this point. The sigmoid flexure was brought into the wound and compressed between the index finger and thumb. Insufflation was again followed by escape of gas, demonstrating that the perforation was below this point. Inch by inch the bowel was examined by this method in a downward direction, until a perforation was found in the anterior portion of the rectum at a point where the peritoneum covering its anterior wall is reflected upon the bladder. This perforation was rendered accessible to direct treatment by an assistant making traction on the colon and by keeping the margins of the wound well retracted by means of a pair of Hegar's retractors. It was closed by five Lembert sutures, with the greatest difficulty, on account of its deep situation and inadequate light, which was furnished by two candles.

From the perforations in the ileum there escaped pieces of green apples and intestinal contents, and from that in the rectum fluid feces.

The peritoneal cavity was freely irrigated with a one-third per cent. solution of salicylic acid. After completion of peritoneal toilet, a glass drain was introduced in such a manner that the distal open end was placed opposite the sutured rectal wound, and the abdominal incision closed in the usual manner.

Whiskey was freely administered hypodermatically during the operation and after its completion, as the patient remained pulseless for half an hour.

Time of operation two and a half hours.

The foot of the bed was elevated and dry heat applied to the extremities.

10 P.M. Temp. 99.5° F.; pulse rapid and weak. About one ounce of bloody serum withdrawn from glass drain.

Sept. 10, 8 A.M. Temp. 99° F.; pulse 126. Clear serum only in the drain; about one drachm withdrawn every three hours. During the day the patient was slightly delirious, and in the absence of the nurse he got out of bed and walked across the ward to another bed.

8 P.M. Temp. 99.8° F.; pulse 144. Some tympanites. Ordered one drachm of turpentine in half a pint of warm water, as an enema, which was followed by free discharge of feces and flatus.

11th. Temp. normal; pulse 104. Natural passage from bowels; delirium continues.

12th. Temp. normal; pulse 96; delirium disappeared. Allowed liquid food in small quantities.

13th. Pulse 72. The contents of the glass drain have a suspicious fecal odor. Glass replaced by rubber drain. Slight diarrhœa, which relieved the tympanites.

14th. A fecal fistula has formed along the track of the drainage-tube. Large rubber tube introduced through the anus, and left in rectum to allow free escape of fluid feces. Fluid injected into fistula does not flow through the rectal tube. Rectum disinfected every four hours with saturated salicylic acid solution.

9 A.M. Temp. 101° F.; pulse 126.

17th. Temp. normal; pulse 108. Free discharge of fluid feces from rectal tube and fistula.

18th. Sutures removed from the abdominal incision; only deep parts united, granulating surfaces approximated by strips of adhesive plaster over an antiseptic compress.

19th. Fluid flows freely from fistula through the rectal tube. No feces have escaped through fistula for twelve hours.

20th. Rectal tube withdrawn, followed by return of fecal discharge through fistula.

Oct. 1. The discharge of feces through the fistula has been gradually diminishing, and has now ceased.

19th. Fistulous track completely closed. Abdominal incision all healed, except a small granulating surface at lower angle.

Patient discharged cured, November 3d.

REMARKS.—The subjective symptoms in this case four hours after injury, and after transporting the patient a distance of six miles, furnished no indications whatever of the extent of visceral injury which was found on exploring the abdominal cavity. The rectal insufflation of hydrogen gas at once rendered the diagnosis positive, and pointed out the necessity of treatment by abdominal section. Eleven perforations were found and sutured without much difficulty, but the last perforation in the deepest portion of the pelvis could not have been found by any other means of diagnosis short of rectal insufflation. Had this perforation been overlooked death from septic peritonitis would have been inevitable. Drainage was resorted to in this case, not only from the fact that fecal extravasation had taken place, but also for the reason that owing to the difficulty in gaining access to the rectal wound I feared that the suturing was not as perfect as it should be, and by proper drainage I wished to prevent possible extravasation into the peritoneal cavity from this cause. Subsequent events showed the propriety of this precaution.

CASE II.—J. E. (case of Drs. Gudden, Steele, and Gordon, of Oshkosh), eighteen years of age, was out target-shooting with a companion, who, while raising his 22-calibre rifle to his shoulder, accidentally discharged it; the bullet struck the patient in the abdomen. He was about forty feet distant, and almost directly facing his companion. When first seen by Dr. Gudden, within half an hour after the injury was received, he was suffering severe pain in the abdomen, was pale, covered with cold, clammy perspiration, and vomited frequently. He was placed in a carriage and conveyed to his home, a distance of two miles. During the journey, the severity of the abdominal pain was so increased by the motions of the carriage as to necessitate repeated stops.

I saw the patient, with the above-named physicians, October 9th, 4 A.M., twelve hours after the accident.

Examination.—The wound of entrance was found to be at the outer margin of the left rectus about one inch below the level of the umbilicus. Abdomen dull on percussion in left iliac region, pulse 140, temperature 100° F. Penetration of the abdomen was proved by the introduction of a grooved director, which was left in place during the insufflation of the hydrogen gas.

The patient was placed under the influence of chloroform, and during the operation the narcosis was maintained with ether. The abdomen was thoroughly disinfected, and rectal insufflation of hydrogen gas practised to ascertain if any perforation of the intestine existed. Under a pressure of about a half a pound to the square inch, and the use of one-quarter of a gallon of gas, in a few minutes the gas escaped along the groove of the director, and, on applying a match, lighted as it escaped. The flame was now extinguished by a moist sponge, and the abdomen opened by a median incision, five inches in length, extending from the umbilicus to near the pubes.

On exposing the peritoneum at the lower angle of the incision, through this membrane there was observed a structure closely resembling an over-distended bladder. That this structure was a distended bladder was improbable as the boy had urinated before the anæsthetic was administered. The peritoneum was carefully incised between two forceps and divided upon a grooved director to the same extent as the external incision, and it was then discovered that what appeared to be an over-distended bladder was a coil of small intestine distended with blood to twice its normal size. The whole pelvic cavity was found filled with fluid blood. On withdrawing the small intestine, five perforations near the junction of jejunum and ileum, and within a distance of three feet, were found; four occurred in pairs on the lateral aspect of the bowel, and one at the mesenteric attachment. All the perforations were disproportionately large to the size of the bullet and would easily admit the tip of the index-finger. The intestine, at the point of injury, was covered with a thick layer of recent plastic lymph, and the parietal peritoneum presented all the evidences of a beginning diffuse septic peritonitis. The intestine, which was over-distended by blood-clots for about three feet, was emptied and irrigated with a one-third per cent. solution of salicylic acid, which was used for constant irrigation during the entire time re-

quired in suturing the perforations, which were closed by Czerny-Lembert sutures.

Further examination disclosed four perforations of the mesentery, from two of which quite profuse venous hemorrhage was still going on. The hemorrhage was arrested by ligature *en masse*, by passing a needle, threaded with fine silk, through the entire thickness of the mesentery, on either side of the perforations.

Rectal insufflation of hydrogen gas was repeated so as to ascertain if any other perforations existed, and the gas after it had been gently forced beyond the highest perforation was made to traverse the balance of the entire intestinal canal by drawing forward loops of the intestine and returning them as examined without further insufflation. This procedure was found entirely satisfactory and practical, as the gas on account of its low specific gravity readily entered the highest point in the prolapsed intestinal loop.

The abdominal cavity was irrigated with salicylic acid solution, numerous coagula removed, the toilet completed, a glass drain introduced into the pelvis, and the abdomen closed.

Duration of operation two hours. Patient collapsed, pupils greatly dilated, and almost pulseless in spite of repeated hypodermatic injections of brandy, which were administered when signs of collapse became apparent, throughout the operation. Enema of a teacupful of warm water and two ounces of brandy. Foot of bed elevated and external dry heat applied.

In an hour and a half he rallied somewhat from the operation, but again sank and died at 3 P.M., eight hours after the completion of the operation.

Post-mortem eighteen hours after death (Drs. Steele, Gudden, Gordon). Circumscribed peritonitis present at time of operating, now diffuse; very little fluid in abdominal cavity; several small blood-clots in vicinity of transverse colon. The perforations were all securely closed, and the bullet was found in the soft tissues to the right of the spinal column, between the fourth and fifth lumbar vertebræ, and near the ascending colon. The bullet though only of 22-calibre was oblong and may thus explain the unusually large size of the perforations.

REMARKS.—This case compared with the foregoing furnishes a strong argument in favor of early operative interference in cases of gunshot or stab wounds of the abdomen in which the existence of visceral lesions can be demonstrated by rectal insufflation of hydrogen gas. In the first case, although twelve perforations were found and sutured, and fecal extravasation had taken place, no evidences of peritonitis were found, and the patient recovered. In this case twelve hours intervened between the time the injury was received and the treatment by laparotomy, during which time a septic peritonitis had developed, the extension of which the operation did not arrest, and from the effects of which the patient died.

MEDICAL PROGRESS.

Intra-uterine Injections of Chloride of Zinc.—FRÄNKEL (*Centralbl. für Gynäk.*, No. 37) confirms the good results obtained by Rheinstädter in the treatment of uterine leucorrhœa with injections of chloride of zinc. Especially in gonorrhœal disease of the endometrium has this method of treatment proved effective, which accords with Fritsch's recommendation of vaginal injections of zinc chloride in vulvar and vaginal gonorrhœa. In inoperable carcinoma of the uterus, also, Fränkel uses these injections, as originally recommended by Sims (solutions of 2 : 3), after curetting and applying the Paquelin cautery. After the exfoliation of the chloride of zinc crust healthy granulations usually appear, with a tendency to rapid and firm cicatrization. The main symptoms, hemorrhage, offensive discharge, and pain, are ameliorated and early recurrence prevented.—*München. medicin. Wochenschr.*, September 25, 1888.

Malarial Orchitis.—Cases of this affection have been reported by Dr. Charvot: The first feature of malarial orchitis, and one that seems to be well marked, is its occurrence only in those who have suffered severely from ague. The onset of the inflammation may be noticed during an attack of fever, often in the night, and quite apart from any injury, urethral discharge, or other exciting cause of an epididymitis spreading from the urethra. The inflammation is of an acute and severe type. In a few hours the part becomes greatly swollen, and the disease reaches its height in two or three days, and then somewhat slowly and gradually subsides and passes away. In some recorded cases the local inflammatory phenomena have undergone daily exacerbations and remissions in unison with the body temperature, but Dr. Charvot has not observed this in his cases. Both the body of the testicle and the epididymis are involved in the inflammation, and there is effusion into the tunica vaginalis. The skin of the scrotum is not implicated, and is only rarely adherent to the subjacent tissues, although there is inflammatory œdema of the cellular tissue of the scrotum. The pain is usually very severe, and radiates from the testicle up to the groin and round the loins. Under treatment the pain and inflammatory œdema quickly subside, but the absorption of the inflammatory exudation in the testicle takes place much more slowly, and is followed by more or less atrophy of the secreting substance of the gland. The disease is accompanied by malaise, headache, neuralgia, pinched face, and anæmia, all marks of severe malarial poisoning.

The treatment of this form of orchitis, happily, is not very difficult. A full dose of quinine should be given a few hours before the rise of temperature, and this should be repeated daily until the patient is continuously apyrexial. The beneficent effect of quinine is quickly seen in the fall of the temperature, the abatement of the pain, the lessening of the headache and malaise, and often in the quick subsidence of the scrotal œdema. If its influence is maintained, the swelling of the testicle shrinks, and the gland becomes smaller and softer, with loss of testicular sensibility. No special local treatment is required. The fever which is always associated with malarial orchitis is not symptomatic: it most often precedes, but is by no means in proportion to, the inflam-

mation of the gland, and it yields to treatment by quinine much more quickly than does the orchitis itself. The liability to wasting of the gland renders it important to recognize the nature of this disease as soon as the patient is attacked by it. As a rule, the diagnosis presents no grave difficulties. From gonorrhœal orchitis it is distinguished by the affection of the body of the gland as well as of its epididymis, by the character of the fever, by the history of the patient, and by the very marked influence of quinine given in full doses. It is more closely like the orchitis of mumps; but where there has been no parotid inflammation to assist in the diagnosis, the intermittent or remittent character of the fever, and the failure of the swelling to undergo rapid absorption after the fall of temperature, are sufficient to distinguish it. The effects of a single large dose of quinine are also so well marked in malarial orchitis that in any doubtful case the therapeutic test is of great value. Dr. Charvot has found more difficulty in distinguishing this form of acute orchitis from an acute tubercular affection; but in the latter the epididymis is markedly nodular, and there is a notable tendency toward suppuration. Although the disease is very little known in England, it is yet one worthy of careful study. Patients saturated with malaria often return home to this country with various manifestations of the disease; and our military surgeons, as well as many private practitioners, may find themselves called upon to treat this affection when residing or travelling in foreign climes.—*The Lancet*, Oct. 20, 1888.

Tincture of Phosphorus in Infantile Asphyxia.—DR. FARICI has obtained such excellent results in the treatment of asphyxia, occurring in the course of broncho-pneumonia in children, that he advises the use of the following formula:

℞.—Cinnamon water . . 100 grammes.
Ethereal tincture of phosphorus . . . 8 drops.
Syrup of ether . . . 20 grammes.—M.

The dose is a teaspoonful hourly.—*Lyon Médical*, September, 1888.

Sectio Alta Intraperitonealis.—Under this title RYDYGIER, of Cracow, in the *Przeglad lekarski*, describes a new method for the removal of large calculi from the bladder, which he has successfully carried out. In the high operation for stone, on the one hand is the danger of peritonitis, on the other that of urinary infiltration. The various methods to avoid the first have not proved successful; as cases of Guyon and Dittel show. Suture of the bladder, as recommended on many sides, does not always prevent the second complication; the suture gives way or the wound fails to heal by first intention and the granulations on the edges of the wound are insidiously infiltrated. The ends of the suture left protruding in the bladder in using Brenner's tobacco-pouch suture may furnish the nucleus for a new calculus. It suggested itself to Rydygier that the readiness with which peritoneal adhesions form might be availed in operations upon the bladder. In the present condition of antisepsis he proposes to open the bladder at a point where it is covered by peritoneum. A series of prefatory experiments upon dogs led to the successful performance of sectio alta peritonealis upon a thirteen year old boy in December last, and upon other older patients subsequently. Rydygier thinks the method available for neoplastic operations upon the bladder and for wounds of the lining membrane. The operative incision always unites by first intention.—*Wiener medizin. Presse*, No. 40, 1888.

Constipation with Hemorrhoids.—

℞.—Glycerin . . . . . 60 parts.
Soap . . . . . 10 "
Ext. rhei fluidi . . . . 40 "
Essence of chamomile . . 10 drops.—M.

Use as an enema three times daily.—*Revue de Thérapeutique*, October, 1888.

Tubercular Meningitis cured with Iodoform Ointment.—Five cases of this disease are reported by WARFWINGE (*Arch. di Patol. Inf.*, May, 1888) as cured by this treatment. Whatever errors there may have been in diagnosis, the author thinks it hardly possible that he could have erred in all five cases, though he admits that a differential diagnosis between tubercular meningitis and the less grave variety, during life, is very difficult. In all of the cases reported the plan of treatment consisted in first shaving the hairy scalp and then rubbing in upon the skin a quantity of ointment composed of one part iodoform to five of vaseline, the head being then covered with a tarletan hood with an opening for the face. At each daily friction two grammes of this ointment were used, and the treatment was continued from nine to thirty-two days. Moleschott first advised the use of iodoform for internal diseases in 1878, and he successfully treated three out of five cases of tubercular meningitis by applications of iodoform collodion to the scalp. Nillscez and Souders have also each reported a successful case of this disease treated in the same manner.

The author offers the following suggestions based upon his experience in this connection:

1. Iodoform, which does not contain less than 96.7 per cent. of acid, is nearly insoluble in water and in blood-serum, and cannot penetrate the animal economy except through the medium of fatty substances with which it may be combined.

2. It is probable that when it is applied by friction it is received into the subcutaneous adipose tissue, which acts as a vehicle to its transmission. According to Binz, it is broken up, with the liberation of iodine, and this is absorbed and carried along by means of the organic fluids.

3. The iodine, in such cases, will act upon the protoplasm of the cells, both developing and destroying it.

4. This explanation will apply in regard to the treatment of tubercular meningitis by iodoform inunction; in accordance with which the free iodine would be carried by the lymphatics to the surface of the brain.

5. Whatever value be attached to any particular method of rubbing in the iodoform in tubercular meningitis in children, it would seem as if the subject were worthy of the serious attention of the profession.

6. Future experience may show that more rapid results may be obtained by some modification of this method than have thus far been reported. On the other hand, the prolonged use of iodoform is not followed by any accident.—*Archives of Pediatrics*, November, 1888.

The Treatment of Acne.—DR. ISAAC, before the Berlin Medical Society (*München. medicin. Wochenschr.*, No.

39, 1888), related the method of treatment of acne at the clinic of Lassar. The following ointment is applied to the affected parts with a spatula or stiff brush, remaining for a half hour or an hour:

℞.—Beta-naphthol . . . 10 parts.
Sulphur. præcip. . . . 50 "
Sapo virid.,
Vaselin. flav. . . . āā 20 " —M.

On the following day, irritation and desquamation are apparent, which are completed at the end of a week. Slight irritation, which occurs at times, is relieved by the use of a drying powder. Oesterreicher has proposed a modification of this ointment which is particularly useful in obstinate cases. It consists in the addition of ten per cent. of camphor and a reduction in the amount of sapo viridis and vaseline to five per cent. This ointment should remain but a quarter of an hour. Isaac yet recommends a paste of resorcin:

℞.—Resorcin . . . . 2.5 to 5 parts.
Zinc. oxid.,
Amyli . . . . . āā 5 "
Vaselin. flav. . . . 12.5 " —M.

This paste may remain during the day and night, and on the following day is removed with cotton or oil. In about twenty patients thus treated no irritation occurred. The cure is speedy, occurring often in three to five days. —*Medicin. Chirurg. Rundschau*, October 1, 1888.

Salicylate of Soda in Pruritus.—ICARD reports the case of a patient who had suffered nine months from intolerable itching of the skin, and had tried remedies innumerable, who was speedily cured by the internal administration of forty-five grains of salicylate of soda daily.—*La Gazette Médicale.*

Antipyrin Rashes.—DR. C. C. CLAREMONT, at a meeting of the Southeast Hants District Medical Society, read a paper on antipyrin rashes, in which he described two cases which had occurred in his practice during the course of enteric fever. In the first, ten doses of fifteen grains had been given in the course of ten days when the eruption appeared. It came out simultaneously on the abdomen, thorax, back, and limbs in the form of papules, darker, larger and more solid than the spots of enteric fever. There was a considerable resemblance to measles. The eruption developed into enormous erythematous blotches, with much infiltration, their vivid red color being removed by pressure, leaving faint yellow pigmentary discoloration. The rash began to subside on the sixth day, and on the tenth day was only represented by faint coppery maculæ, resembling an old syphilitic eruption. Antipyrin was omitted on the appearance of the eruption. In the second case the drug had been given in fifteen-grain doses, generally twice a day, and omitted altogether for four days. The enteric exanthem had been unusually copious. On the twentieth day of the exhibition of the drug there was a papular erythematous rash on the extensor surfaces of the arms; this spread to the flexor surfaces, and also affected the calves. The antipyrin was omitted. On the fourth day the rash had almost gone, leaving only slight redness and desquamation. The patient had a relapse of fever, and was again treated with antipyrin without suffering from a return of the eruption.

Dr. Claremont stated that antipyrin rash generally was of the papulo-erythematous type, and began on the extensor surfaces of the elbows and knees. It had been described in one case as commencing on the face, and in another as extending to the mucous membranes. Once vesicles had been present. Its most constant characters were its bilateral symmetry and its duration of about five days, irrespective of the continuance or withdrawal of the drug. The entire absence of subjective symptoms was exceptional. A scarlatiniform rash had been mentioned, but Dr. Claremont had been unable to ascertain that it was more than a transient flushing, such as is produced by belladonna.—*British Medical Journal*, October 27, 1888.

The Treatment of Gonorrhœa.—EHRMANN (*Centralbl. für die ges. Therap.*, No. 9, 1888) recommends three per cent. solutions of boric acid or resorcin as the mildest disinfectant injections in the early stage. In the case of resorcin, the injection is made every two or three hours. In general, more than three injections a day are unnecessary. The frequent application of the nozzle of the syringe excites mechanical irritation; and it is not always possible, with frequent injections, for the patient to urinate previously sufficiently to wash out the pus in the urethra. On account of its comparatively high price and its ready decomposition, resorcin is rarely used. Most frequently sulpho-carbolate of zinc is ordered, which exists in colorless, transparent, tabular crystals, efflorescent in the air and slightly soluble in water and alcohol. Though the sulpho-carbolate is a weak astringent and disinfectant, strong solutions are not begun with. As soon, however, as the second portion of urine passed is clear, a solution of sulpho-carbolate of zinc, one part in two hundred, is used. From week to week this is increased to four or five parts in two hundred. Rarely is it necessary to use six or seven parts. This method of treatment has furnished excellent results.—*Medicin. Chirurg. Rundschau*, October 1, 1888.

Treatment of Dyspepsia.—DUJARDIN-BEAUMETZ divides dyspepsia into three classes: that caused by excessive secretion of gastric juice, that caused by a deficiency of secretion, and that depending on sympathetic troubles. In that where secretion is deficient, he gives pepsin, toasted bread, *bouillon*, powdered beef, and hydrochloric acid:

℞.—Acidi hydrochlorici . . . 4 parts.
Water . . . . . 1000 "
A wineglassful at the ending of meals.

When the secretion of the gastric juice is excessive, the diet is principally vegetable, though slightly cooked eggs are allowed.

In dyspepsia due to sympathetic troubles the diet is strictly vegetable.—*Révue de Thérapeutique*, October 15, 1888.

For Hyperhidrosis of the Feet.—

℞.—Acidi chromic. . . . 1 part.
Aquæ . . . . . 100 parts.—M.

Saturate a pledget of lint with this solution and place between the toes.—*Le Progrès Médical.*

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SATURDAY, NOVEMBER 10, 1888.

GLYCERINE CLYSTERS.

IT is now about a year since glycerine, which has been employed by internal administration for a long time with more or less effect for the relief of constipation, was first recommended for this purpose in the form of enema. Anacker's so-called minimalclysmata (*Deutsche med. Wochenschr.*, p. 823, 1887) and Unger's microclysmata (*Pharmaceut. Centrallhalle*, Berlin, 1887, 42), described nearly at the same time, immediately attracted the attention of practising physicians throughout the world. Numerous clinicians have reported the results of their use of glycerine in this manner in hospital and private practice. It is obvious that a condition so influenced as is constipation by individual peculiarities, habit, mode of life, diet, drink, and exercise; a condition frequently in itself a symptom of constitutional or of local disease, is sure to yield uncertain results when subjected to investigation by the numerical method. We may, therefore, reasonably demand more than mere statistics of successes and failures following the administration of minimal clysters of glycerine from those who, as von Vamossy, Seifert, Reisinger, Boas, and Mayer, of Wilkesbarre, have published accounts of their experience with this treatment.

Ullmann, of Vienna (*Centralblatt für die Gesammte Therapie*, August, 1888), has investigated this method of treating constipation with regard to the following points: 1, the general condition of the patient, with special reference to the disease from which he suffered, the state of the digestion, the presence or absence of habitual constipation and the objective phenomena relating to the intestinal canal; 2, the dejections, as regards amount and consistence; 3, the time elapsing between the administration of the enema and the effect; 4, the subjective sensations of the patient, as regards abdominal pain, local irritation, and increase of previous pain; 5, unusual manifestations, as colic, mucus or blood in the dejections; and, finally, 6, the time and consistence of the next following spontaneous evacuation.

Regarding quantity, the result was variable. After 226 injections, the discharge in 71, or 34.4 per cent., was abundant; in 103, or 45.5 per cent., it was incomplete; in 52, or 23.1 per cent., there was either no result or a mere scanty intestinal secretion mixed with the injected glycerine. It was further found that in females and in persons suffering from a tendency to habitual constipation and after repetitions of the treatment the result was in general less satisfactory than in the case of males, in mere transient constipation, as, for example, that occurring in fevers, and in single or infrequently repeated administrations of the glycerine.

The consistence of the discharge was, in 145, or 83 per cent., of the 174 cases in which the treatment was effective, hard, the stools being either formed or composed of masses of scybala; in 22 cases, or 13 per cent., the stools were mushy and unformed; in only 7 cases, or 4 per cent., were they watery. The last occurred in patients subject to diarrhœa.

Subsequent constipation lasting, when untreated, five or six days, occurred in 68 of the 174 instances, 39 per cent. Subsequent diarrhœa occurred in 6 cases, 3 per cent. These were individuals suffering from visceral tuberculosis. And in 3 of them, *post-mortem* examination revealed the existence of tuberculosis of the intestines.

Painful sensations before, during, or immediately after defecation were complained of in only 5 instances—3 cases of recent parametritis, 1 of retroversion of the uterus, and 1 of chronic tuberculous peritonitis. Careful inquiry, however, elicited the fact that a trifling burning sensation in the anus was not infrequent after defecation, but that it usually subsided in a few minutes.

The infrequency of borborygmi, which were spoken of by only 9, or 4 per cent., of the patients, Ullmann ascribes to the same cause as the non-escape of flatus,

namely, the failure of the intestine above the rectum to participate in the response to the activity of the glycerine.

It is in this connection worthy of note that in a majority of the cases in which the glycerine enemata failed, rectal examination and abdominal palpation showed on the one hand a relaxed and atonic condition of the lower bowel; on the other hand, an upper portion of the intestinal tract to be the seat of the fecal accumulation.

In such cases large enemata of water or purgatives administered by the mouth were followed by more or less copious evacuations. The failure of glycerine is explained by the peculiarities of its action. This Anacker ascribes to the powerful irritating effect of the glycerine, due to its avidity for water, upon the mucous membrane of the rectum. This irritation causes a local hyperæmia with fluxion to the mucous membrane and reflex intestinal peristalsis. Reisinger, who found that other substances having avidity for water, as, for example, concentrated saline solutions, gave negative results, concludes that it is not this property of glycerine, but some other peculiar chemical attribute of that substance to which its efficacy in this respect must be ascribed. Unger holds the opinion that the glycerine produces its effects by reason of the profuse hypersecretion which it provokes; and in this opinion Ullmann coincides. The last observer, however, believes that the peristalsis excited is restricted to the lower portions of the large intestine. This opinion is based upon the almost invariable failure of the administration when the rectum is either empty or relaxed, upon the absence of borborygmi, upon the rare occurrence of flatus or colic, upon the immediate cessation of tenesmus so soon as the glycerine has been voided, and, finally, upon the infrequency of repeated liquid evacuations.

As a rule, the action of glycerine is prompt, the result following, in the large majority of instances, in from three or four to fifteen minutes. The dose administered varies from 3 to 6 grammes (that is, from 45 to 90 minims). Ullmann concludes that glycerine thus administered exerts a specific action upon the lower bowel, an action unattended by unpleasant sensations or unfavorable influences; that it is especially available when it is desirable to evacuate the lower bowel promptly, as before surgical operations, in accouchement, for purposes of rectal and vaginal investigations and the like. This method is also available when it is desirable to empty the lower bowel without exciting extensive peristalsis, as in cases of internal hemorrhage, hæmoptysis, painful affections of the abdomen, or when, for any reason, it is undesirable to change the position of the patient in bed. In intestinal obstruction or fecal accumulations in the small intestine or in the upper part of the large intestine, or where constipation is due to acute or chronic catarrhal processes in the small intestine, or to obstruction by gall-stones, glycerine injections are without effect. They are, by reason of the pain which in such conditions they occasion, contraindicated in ulceration of the rectum and painful inflammatory affections of adjacent parts, as acute prostatitis, parametritis, cystitis, and analogous processes.

In habitual constipation, glycerine injections are to be used for occasional relief, never habitually. The amount of irritation which they occasion, as shown by copious serous and mucous discharges containing numerous epithelial cells, indicates a danger that their too frequent use may cause local inflammation or ulceration.

We may add that we have thus employed glycerine with equally satisfactory results in the case both of infants and adults in hollow suppositories of cocoa butter—a more convenient method.

THE DISINFECTION OF INSTRUMENTS AND APPARATUS.

EACH succeeding day renders more palpably true the tenet that the fate of a wound, whether it progresses to cure in the natural, ideal manner or wreaks from least to greatest injury upon its unfortunate host, undoubtedly depends, in almost all instances, upon the knowledge, actions, and precautions of the surgeon who may happen to have it in his care. The conscientious surgeon will, therefore, never consider that he has arrived at a millennium of wound treatment until every wound under his hands pursues the most desirable course.

Of the various means at our command for this most invaluable attainment the employment of absolutely sterile instruments and appliances is of import secondary to none. The most complete series of experiments to ascertain the best methods of rendering instruments surgically clean and innocuous are those which have recently appeared in the *Berliner klinische Wochenschrift*, No 35, 1888, from the pen of HUGO DAVIDSOHN. But whilst the deductions which are corroborated by these valuable experiments have long been familiar to us, still they possess especial merit and value in positively deducing

by the only true and scientific method an absolutely reliable, yet safe and simple, process of rendering our appliances free from all varieties of living bacteria and spores.

After experimenting upon an extensive scale and in a most thorough and careful manner, Davidsohn comes to the conclusion that moist heat is by far the simplest, safest, and most certain of microbe- and spore-destroying agencies within our present reach and knowledge. By its application to instruments infected in every conceivable manner he has found that they were invariably rendered sterile in a very short time. In fact, he has proved that all forms of bacteria and spores, no matter where situated—including the hard-dying anthrax bacilli—are invariably deprived of life and harmfulness by simple exposure to moist heat of 212° F. for five minutes. This degree of heat is best obtained by boiling the instruments, apparatus, etc., in a closed vessel—that is, one with a fairly snug-fitting lid, so that the temperature of all portions within may be maintained at an even 212° throughout; for if this precaution is neglected, the upper strata of water will be cooler than those lower down, and only the water actually upon the bottom of the vessel will reach the desired and necessary temperature. Such boiling, if continued for five minutes, he finds amply sufficient for thorough disinfection of even complicated instruments, canulas, catheters, etc., provided that the water fills all canals and hollows and comes in contact with every part.

The perfected process thus evolved which he would recommend for general adoption is as follows: After operation all instruments are to be rinsed well in cold water and scrubbed, and hollow instruments are to be injected and left filled with water. They are then to be actively boiled for five minutes in a closed vessel, care being exercised that no portions project above the surface. Finally, they are to be dried with a sterilized towel and put away in an aseptic place. Before being used again they should be boiled under precisely similar conditions, and used direct from the water when it has become sufficiently cooled. Davidsohn has been unable to discover the slightest harm which this method inflicts upon properly constructed instruments.

THE Boylston medical prize of four hundred and fifty dollars has been awarded by Harvard University to Dr. George H. F. Nuttall, of San Francisco, for a dissertation entitled, *A Contribution to the Study of Immunity*.

THE American Academy of Medicine will hold its twelfth annual meeting at the New York Hospital, 8 West Sixteenth Street, New York, Tuesday and Wednesday, November 13th and 14th.

THE Cincinnati Polyclinic was organized October 31st, with Dr. Charles A. L. Reed, as Dean of the Faculty; Dr. Longstreet Taylor, Secretary, and Dr. R. B. Hall, Treasurer. The Faculty is made up as follows: General Medicine, Drs. Andrew C. Kemper and E. W. Mitchell; Diseases of Children, Dr. H. W. Rover; Diseases of Women, Drs. Rufus B. Hall, Charles A. L. Reed, and Edwin Ricketts; Diseases of the Eye, Dr. Robert Sattler; Diseases of the Throat, Drs. A. B. Thrasher and J. H. Boylan; Diseases of the Skin, Drs. A. Ravogli and Merril Ricketts; Surgery, Drs. Longstreet Taylor and Wallace Neff. The Faculty are almost entirely identified with the three medical colleges, and many of them with the various hospitals of the city. A large clinic has already been built up.

OVER two hundred cases of sickness, caused by eating cheese, have been reported to the Ohio State Board of Health, within a few months, the towns of Urbana and Mansfield contributing about fifty cases each. Grave symptoms, even to complete syncope, appeared in some cases, but there were no deaths.

DR. JAMES CRANE died in Brooklyn, October 13st, aged seventy years, of apoplexy, supervening upon four years of cerebral disease, which had necessitated retirement from professional life for that length of time. He was a native of Newark, N. J., a graduate of Princeton College, a pupil of Dr. George McClellan, and a graduate of Jefferson Medical College in 1839. His medical career was successful and honorable. He was one of the foremost of the health officials of his time, very many of the reforms in the health administration of Brooklyn taking place during his incumbency at the health board. He was twice Commissioner of Health, first holding office in 1866, in the famous and efficient Metropolitan Board which was called into being by the cholera epidemic of that time, and which was the first genuine impulse toward sanitary reform in New York City and vicinity. Forcible and fearless in his official work, he initiated measures for the repression of infectious disease which he lived to see adopted or imitated in many other cities; and his name will be remembered by those who have to deal with the problems of preventive medicine.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

Stated Meeting, November 1, 1888.

THE PRESIDENT, A. JACOBI, M.D., IN THE CHAIR.

DR. J. LEWIS SMITH read a paper on

SUDDEN HEART FAILURE IN DIPHTHERIA; ITS PATHOLOGY AND TREATMENT.

There is no other disease, he said, in which sudden, unforeseen, and fatal attacks of heart failure occur so frequently as in diphtheria, and no other disease in which physicians (largely on account of these unexpected attacks of weakness of the heart) are so frequently deceived in their prognosis. In most cases of this kind death speedily occurs even when the medical attendant has made a favorable prognosis a few hours previously. The pulse becomes feeble, and abnormally slow or rapid. It is at first usually slow and subsequently rapid; while the respiration is superficial, and the surface becomes pallid and perhaps slightly cyanotic. In the more favorable cases the patient may rally by active stimulation, and, perhaps, eventually recover, or, after some hours or a day or two of comparative comfort he will succumb to a return of heart failure.

In order to give a clear and accurate idea of the clinical history of sudden heart failure in diphtheria, Dr. Smith quoted, with comments of his own, a number of typical cases occurring in the hospital service of M. de Gassicourt, which he said he had related on account of the completeness of the latter's records. In some of these the heart failure occurred early in the course of the disease, and in others during its later stages. M. de Gassicourt met with one recovery to fourteen deaths, and the case which recovered was of special interest from the fact that the heart failure preceded the palatal and other forms of paralysis, instead of being preceded by them, as is ordinarily the case.

Dr. Smith then proceeded to discuss the cause of this sudden loss of power in the heart in diphtheria. Bouchut and Lagrange attributed it to endocarditis; a hypothesis based on the appearance of the free edge of the mitral valve, and sometimes of the aortic valves in addition, which seem to be roughened as if from the presence of minute vegetations. It is a fact, however, that it is very seldom that a bruit or heart signs indicative of endocarditis are observed during life; while after death the surface of the valves and the endocardial surface are usually found to have undergone no appreciable change, such as endocarditis would be likely to cause.

Moreover, the roughened condition of the edges of the mitral and aortic valves upon which this theory was based, has been found with equal frequency in children who have perished with other diseases, and the late Prof. Parrot had expressed the decided conviction that this condition does not have an inflammatory origin, but is an anatomical peculiarity, which originates in fœtal development. De Gassicourt arrived at the conclusion that "diphtheritic endocarditis is extremely rare, as pathological anatomy and clinical observation alike demonstrate," and Dr. Smith therefore believed this theory to be untenable.

Weakening of the heart's action in diphtheria, and sudden death as a consequence, he went on to say, had with more probability been attributed to granulo-fatty degeneration of the muscular fibres of the heart, consequent upon a prolonged and severe attack of the disease; and he quoted Oertel in support of this hypothesis. Such degenerative changes, if occurring in a considerable proportion of the muscular fibres of the heart, would, he said, inevitably render the contractile power of the organ feeble and perhaps inadequate. Still, if we regarded it as a cause of sudden heart failure, it was such probably in certain cases only; for in most instances the weakening of the power of the heart was sudden and during convalescence, at a period, therefore, when degenerative changes were most likely to occur. In most of the recorded cases the contractile power of the heart did not appear to have been notably weakened previously to the attack of heart failure, as probably would have been the case were degenerative changes in the myocardium the sole or chief cause. Furthermore, in typical cases of sudden heart failure the microscope sometimes revealed a perfectly healthy myocardium after death.

The accident had also been attributed to cardiac thrombosis, and among the most strenuous advocates of this theory was Dr. Beverly Robinson, whose thesis on this subject, published in 1871 in Paris, was alluded to by nearly all recent French writers on this subject. But, as several observers had pointed out, the heart clots were identical in appearance and kind with those found in the heart after death from other diseases; there was every reason for the belief that they occurred during the death struggle, and were not the primary cause of the heart failure, but secondary to it. The opinion of most pathologists was, he thought, explained by de Gassicourt in his clinical treatise, "I have often shown you these clots, and I have enabled you to see that they occur equally in children dead of diphtheria and in those who have succumbed to other maladies, in subjects struck with sudden death, and in those who have not been attacked by any sudden casualty. This objection is in itself conclusive. You have been able to see also that the constitution of these clots does not have any of the characters which the most competent authors have assigned to clots formed during life. They are the clots of the agony."

The theory of deficient innervation, or a true cardiac paralysis, Dr. Smith thought the most tenable. It appeared to be applicable to the largest number of cases and afforded the most satisfactory explanation of those cases in which death occurred during apparent convalescence, when the symptoms were fast disappearing with the exception of the palatal or other paralysis, as well as the most satisfactory explanation, also of the occurrence of those obscure cases in which the post-mortem examination had shown an apparently healthy state of the heart. The theory of an arrested or deficient innervation of the heart, furthermore, furnished an explanation of the occurrence of concomitant symptoms in cases of sudden heart failure, such as vomiting, epigastric pain, and dyspnœa or irregular respiration, since the heart derived its innervation from the same source as the lungs and stomach, viz., through the pneumogastric. He felt justified, therefore, in his classification of the forms of diphtheritic paralysis in making a distinct class

having the designation cardiac paralysis, or, to adopt the French expression, cardio-pulmonary paralysis.

He then went on to speak of the etiology of cardiac paralysis. It was, as had been seen, with few exceptions, associated with, and preceded by other forms of paralysis, and it was probable that, in most cases, it had the same pathology and cause. What was true in reference to the cause and nature of palatal and multiple paralysis, and even of abolition of the tendon reflexes, was probably true of cardiac paralysis. Gubler, in his memoir published in 1860–61, attributed paralysis of the velum and palate to disease of the terminal nerves produced by contiguity, or propagation from the inflamed fauces; but this theory was short-lived, for physicians soon perceived that it was inadequate to explain the occurrence of paralysis at a distance from the inflamed surfaces, while palatal paralysis sometimes occurred after cutaneous and other forms of diphtheritic inflammation in which both the fauces and nares remained entirely healthy. Trousseau considered that the real cause of diphtheritic paralysis was the poisoning of the system by the morbific principle which generated the malady, and believed it doubtful whether its mode of action in producing the paralysis would ever be discovered. The microscopic examinations of Charcot, Vulpian, Roger, Damaschino, Buhl, Pierret, Déjeunè, Oertel, and others, established the fact that the peripheral nerves distributed to paralyzed muscles had, in certain instances, at least, undergone degenerative changes. Pathologists had attributed these lesions to a neuritis, and hence the widely accepted theory that the cause of diphtheritic paralysis is a peripheral neuritis. But anatomical changes equally great had been discovered in the spinal cord, especially in its gray matter, and in the roots of the spinal nerves; so that in some cases it was a fact that central lesions occurred, which were quite as extensive and marked as those in the peripheral nerves. Dr. A. Jacobi, seeing the inadequacy of the various theories to explain all cases or forms of diphtheritic paralysis, wrote, in 1860, "It may be positively asserted that diphtheritic paralysis does not in any case depend on one and the same cause."

Dr. Smith then went on to examine, by the light obtained from clinical experience, the prevailing theory that diphtheritic paralysis results from anatomical changes, peripheral or central, or both, in the nervous system, and to inquire whether it was adequate to explain the paralysis as it commonly occurs, whether cardiac paralysis, or the other forms. The following were some of the objections to it:

1. Cases occur in which carefully conducted microscopic examinations reveal an apparently normal state of the nerves supplying the paralyzed part, and of that part of the cerebro-spinal axis from which the nerves arise. Thus, in three cases of typical cardiac paralysis reported by M. de Gassicourt, which had been described in the early part of the paper, the pneumogastric and its bronchus, examined in one case, appeared normal, and in the three cases no lesion sufficient to cause paralysis was found in a careful examination of the medulla oblongata, the central organ of innervation of the heart.

2. Palatal paralysis sometimes occurs as early as the second or third day of diphtheria, and loss of the tendon reflexes as early as the first day; and it seems improbable that a peripheral neuritis, or anatomical changes in the cerebro-spinal axis, such as to cause paralysis, should occur at so early a date.

3. In its commencement, diphtheritic paralysis often exhibits what Trousseau designates mutability, suddenly shifting from one group of muscles to another. It would seem impossible that there should be a sudden recovery from the paralysis, and then, perhaps, on the following day a recurrence of it, if it resulted from degenerative nerve changes, either central or peripheral. A persistent cause should produce a continuous effect.

4. Some of the microscopists who discovered degenerative changes in the peripheral nerves which supply paralyzed muscles, state that some nerve-fibres have undergone complete or nearly complete degeneration, and others partial degeneration, while others still seem to be intact, a condition which would hardly account for the complete paralysis which often exists, for instance, in the velum palati.

5. It has been noted, by both Drs. Sass and William H. Thomson, that diphtheritic paralysis, both motor and sensory, is frequently limited to the parts supplied by a single branch of a nerve, while all the other branches have their normal function. This fact, of not infrequent occurrence, is not, of course, antagonistic to the theory that peripheral nerve lesions cause the paralysis; but it affords a strong, if not conclusive, argument against the theory that central nerve lesions are the cause.

Notwithstanding such objections as these, however, when the lesions referred to are found after death, whether peripheral or central, we naturally inferred that they had a tendency to increase and prolong the paralysis. The present theory relating to the etiology of diphtheria which is gaining acceptance throughout the world, is that the specific germ of the disease acts only locally upon the surface, and that systemic infection occurs through ptomaines, which are produced upon the surface by the agency of the microbes, and enter the system through the lymphatics, or bloodvessels. Even Oertel, who stated, twenty years ago, that he found the micrococcus of the disease in the kidneys and other internal organs, now asserts that he does not find microbes in the interior of the body, but only upon and in the inflamed surfaces in typical cases. If this theory is true, we must attribute anatomical changes in the interior of the body, in the peripheral nerves as well as the cerebro-spinal axis, to the agency of ptomaines, and the ptomaine must be the causal agent, acting directly or indirectly, in diphtheritic paralysis. Dr. William H. Thomson, in his recent paper on diphtheritic paralysis, wrote, "It is quite conceivable that a ptomaine may follow upon the changes which the diphtheritic process sets up in the organism, and thus produce all of its characteristic symptoms. The special tendency of diphtheritic inflammation to cause necrotic and gangrenous lesions lends further support to this surmise."

The ptomaines, Dr. Smith said, sprang into existence suddenly and unexpectedly under favoring conditions, as is seen in the cheese or milk ptomaine, tyrotoxicon; and chemistry, brought to the aid of microscopy, may yet reveal the fact that the common cause of diphtheritic paralysis is a chemical agent acting in some respects, in manner, though not degree, like curare. Clinical facts appear to harmonize best that a ptomaine is the direct cause of the paralysis, especially in cases occurring early and quickly cured; but it would be idle to argue that the

marked degenerative peripheral and central nerve lesions which are so frequently present in those who have died with diphtheritic paralysis, do not prolong and intensify the paralysis, and are in some instances its primary cause.

In speaking of the treatment of cardiac paralysis, Dr. Smith said that it was evident from the nature of the trouble that it must be combated promptly and with the most active remedies. The patient should be kept quiet in bed, with the head low, and alcoholic stimulants administered at once. In sudden seizures hypodermatic injections of brandy act most promptly in sustaining the heart's action. Ammonia, camphor, musk, and electricity are also of service, as well as predigested beef preparations, peptonized milk, and other concentrated foods designed for those with feeble digestion. If the urgent symptoms are relieved by those measures, such remedies should be employed as are useful in other formr of diphtheritic paralysis. In addition to the beef extracts, concentrated foods and alcoholic stimulants, iron and quinine, in moderate doses, are indicated. The use of electricity is suggested by the nature of the attack, though some physicians consider it of doubtful efficacy. If there be reason from the symptoms to suspect the presence of lesions in the central nervous system, the galvanic current, in short sittings, has been recommended in preference to the faradic; while, in ordinary cases, either the direct or indirect current may be employed. Strychnia, however, is regarded by good observers as the most efficacious nerve stimulant in the various forms of diphtheritic paralysis, and he referred to the testimony of Reinhard, Gerasimon, and Henock in its favor. Still, it is a fact that some physicians of experience state that they have not observed any marked benefit from this agent.

THE PRESIDENT said that there were several questions of great interest suggested by the paper which he trusted would receive attention in the discussion. Thus, Is the heart failure, which occurs early in the disease, identical with and dependent on the same cause or causes as that occurring in its later stages? Again, Are the cases in which a slow pulse is noted of the same nature as those in which the pulse is quick? Still, again, Is there any difference between those cases of heart failure, which precede and those which follow general paralysis?

DR. A. L. LOOMIS said that his experience with heart failure in diphtheria was limited to two cases. Both the cases were well on in convalescence, the trouble occurring on the twentieth day, if he remembered rightly, and in both death took place almost instantaneously. In one of these no autopsy was made, but in the other post-mortem examination showed that the heart cavities were distended with pretty firmly organized clots, while the walls of the heart were in a granulo-fatty condition. There was no appreciable change in the medulla oblongata, and the peripheral nerves were not examined. From his observation and reading he had supposed that diphtheritic paralysis and heart failure are not always dependent upon the some cause or causes. In the early stages of diphtheria it had seemed to him that heart failure is due to the direct action of the poison in the system, whatever that might be; as is, no doubt, the case in other diseases, especially typhus fever, in which sudden death not infrequently occurs from this cause. On the other hand, he had been inclined to believe (although there was not, perhaps, sufficient ground for justifying such an assumption), that in the advanced stages of diphtheria heart failure, when it occurs, was due to a peripheral neurosis.

DR. A. CAILLÉ spoke of the importance of keeping all patients suffering from diphtheria strictly confined to bed. He said that formerly he had believed that such patients should be encouraged to get up and go into the fresh air if they were strong enongh to do so, but his later experience had convinced him of the great danger of such a course; and he related one of his cases to illustrate this point. In another case which he mentioned, one of diphtheria following measles, heart failure resulting in sudden death was apparently induced by an error in diet. In the absence of her attendants the child partook of a meal of fried clams and cabbage. He also spoke of the importance of sufficient stimulus in every case of diphtheria, as one of the most efficient preventives of heart failure.

DR. BEVERLY ROBINSON said that, so far as he was able to judge, cardiac failure in acute cases, in the majority of instances, is connected with the ante-mortem formation of clots in the heart (especially the right heart), depending on granulo-fatty degeneration of the walls of the organ. When a hospital interne in Paris he had made a large number of autopsies in such cases, and he had never found any lesions of the peripheric nerves. He believed that the condition of the heart, to which he had referred, could be frequently detected during life in acute cases, if properly looked for. Dr. J. Forsyth Meigs, of Philadelphia, was the first to call attention to this feature of diphtheria. In his experience death did not always occur rapidly; the symptoms of heart-failure often continuing for a considerable time before the fatal termination. After death there would almost invariably be found fibrinous clots, particularly in the right heart, and from their character he believed that they were formed ante-mortem and were to a greater or less extent the direct cause of death. In some instances the condition was associated with more or less broncho-pneumonia, and in others not. Altogether, it seemed to him a sufficient explanation of the phenomena noted. In conclusion, Dr. Robinson said that it was his impression that tincture of chloride of iron, in the large doses in which it is frequently given in diphtheria, has a direct effect in the formation of these heart-clots.

DR. FRUITNIGHT said that he was inclined to believe that the agency of ptomaines, as suggested by Dr. Smith, offers the most plausible explanation of the heart-failure. The condition present is practically a toxæmia, and the treatment must, therefore, be preservative, as well as curative. He differed from Dr. Robinson in his opinion as to the effect of tincture of chloride of iron, and believed it one of the most useful remedies at our command in diphtheria. As it is a medicine given so constantly in this disease, it seemed to him that if it really is the cause of the formation of clots with resulting heart-failure, we should find heart-failure a much more frequent complication than is now the case. It is in the experience of all, he thought, a comparatively rare condition.

DR. SEIBERT said that he thought a differentiation ought to be made between heart-failure occurring in the early stages of diphtheria, which he believed to be due

to the direct action of the poison of the disease on the central nervous system, and that occurring in the later stages, which he believed to be brought about by pathological changes in the heart-muscle. He then related some cases of death from heart-failure, and stated that all the patients died from the attempt to make some exertion.

DR. S. H. DESSAU said that he had been accustomed to think that the heart-failure was due to various causes, and it seemed to him probable that when it occurred in acute cases it was due to cardiac thrombosis. As regards the matter of treatment, he thought strychnia was a dangerous remedy on account of the special susceptibility of children to its effects, and he had known of one instance in which this agent was apparently the cause of death.

DR. LOOMIS said that Dr. Robinson seemed to be of the opinion that it was the heart-clot that killed. He himself, however, did not believe it was possible to have a clot without antecedent heart-failure. It was the heart-failure that caused death, and the formation of a clot was simply the last act, resulting from the slowing of the blood-flow. As to the alleged effect of the tincture of chloride of iron, he could hardly understand how any remedy whatever could increase the coagulability of the blood beyond which it reached naturally in various diseases.

DR. ROBINSON said his personal experience compelled him to differ from Dr. Loomis as regards the formation of clots, and as he had formerly made a special study of this subject, he felt justified in the views which he held. It was a fact that the heart-clot in diphtheria differed absolutely from every other. It was completely fibrinous and formed in layers, and he thought there could be no possible doubt that it existed a long time before death. He did not believe, from his own observation or from any evidence that had been presented to that effect, that heart-failure occurred before the formation of the clot. Direct experimentation had also shown that these clots might be found without any change whatever in the heart structure.

THE PRESIDENT said that in the case of Dr. Loomis in which an autopsy was made, death probably resulted from fatty degeneration of the heart. Or, it was possible, that the child had died simply of syncope, the result of sudden anæmia of the brain, brought about by exertion. In pneumonia it is well known that patients sometimes die suddenly from such syncope. Fatty degeneration of the heart, however, is always a sufficient cause of sudden death. There is one peculiar condition that may be mistaken for heart-failure in the later stages of diphtheria, viz.: Paralysis of the muscles of respiration. This condition usually follows the other forms of diphtheritic paralysis; the paralysis, as a rule, affecting first the throat, then the muscles of accommodation, then the extremities, and, finally, the respiratory muscles. Paralysis of the latter is characterized by shallow respiration, with a great deal of resulting dyspnœa and rapidity of the heart's action. In such cases electricity, repeatedly applied, and strychnia in full doses, are very beneficial. The strychnia should be given hypodermatically, the one-hundredth of a grain of the sulphate every one, two, three, four, or five hours, according to circumstances. Such a case as that referred to by Dr. Dessau he did not think should prevent our using this remedy, as there is always more or less danger connected with the use of any poisonous agent, and some individuals are peculiarly susceptible to the action of special drugs.

It is impossible to say which of our diphtheritic patients are going to die of heart-failure; but we do know that in diphtheria there is such a tendency, and hence it is our duty, in every instance, to do all that we can to prevent such an accident. The indications are to save the strength of the patient by feeding and tonics, and especially to fortify the heart by means of alcohol and such agents as digitalis, sparteine, and strophanthus. In every case of diphtheria we have to deal with sepsis, and alcohol is, therefore, of the highest possible advantage. He believes that no case of this disease can be injured by alcohol, and even the most courageous practitioners often err in giving too little of this invaluable agent. If the choice were given him between alcohol and all other remedies in diphtheria, he would undoubtedly select the former as offering the best chances for the patient. In brief, then, the indications are to save the strength, combat sepsis, and fortify the heart.

DR. SMITH said, in bringing the discussion to a close, that since the stomach and lungs, as well as the heart, are affected, the inference is that the cause of the trouble is some affection of the nerve supplying these three organs, the pneumogastric. It is a fact that a certain proportion of patients attacked with heart-failure recover, and that in some of those who died there is for a time an amelioration of the symptoms; and it seemed to him that this would not be possible if the trouble were due to heart-clot, which would undoubtedly be a permanent condition, unaffected by any treatment that could be adopted. It was also a fact that paralysis of some form almost invariably precedes the heart-failure, and this would seem to indicate that the latter is due to the same cause as the paralysis.

PHILADELPHIA ACADEMY OF SURGERY.

Stated Meeting, October 1, 1888.

R. J. LEVIS, M.D., IN THE CHAIR.

DR. J. EWING MEARS reported the following case of

RADICAL CURE OF INGUINAL HERNIA.

James B., aged forty years, laborer, was brought to the hospital June 4th suffering from strangulated inguinal hernia. Had had hernia since he was six years of age. Had always worn a truss, removing it every Saturday evening and reapplying it Monday morning. Removed truss June 2d as usual, with resulting protrusion, which he failed to reduce. A physician was called in, and after making taxis for a few minutes, failed to reduce. He recommended the patient to St. Mary's Hospital for operation. Dr. Mears was summoned, and after employing taxis succeeded in partially reducing the hernia. There was slight vomiting after this (not stercoraceous).

7 P.M. Patient covered with sweat; temp. 101° F., pulse 100; has a great deal of pain. There was a good deal of swelling in inguinal region, due either to inflammation or recurrence of the hernia; most likely the latter.

Dr. Mears examined the patient, and decided to operate.

An oblique incision about three inches in length was made, the various layers divided, and the contents, as diagnosticated (omental), exposed. The constriction at

the internal ring was divided by the hernia knife, the omentum drawn down and ligated in six equal segments with carbolized silk; the last ligature, after ligating its own segment, was passed around the entire mass. The omentum was next divided, and what was esteemed to be one-quarter of it was removed. The stump was then dropped back into the cavity of the abdomen. The sac was next dissected up from its adhesions, ligated in two places and divided; the upper part was transfixed into the ring by means of a harelip pin, the lower part was dropped into the scrotum. In tearing the sac from its adhesions there escaped about f℥j of clear straw-colored serum. The operation was strictly antiseptic. Only two wire sutures and three of catgut were needed to close the wound. There was slight tympany in the evening.

The wound healed with great promptness, and the sutures were removed on the fifth and sixth days. An attack of diarrhœa delayed the convalescence slightly. Two weeks and a half after the operation the patient sat up, and was discharged six days later. Dissection of the hernia, at the time of the operation, showed it to be congenital in character and the method of dealing with the sac, by double ligature and section, provided a vaginal tunic for the testicle. The proximal stump of the divided sac was twisted and transfixed by a long pin, and this secured in position in the internal ring, forming a barrier to further omental or intestinal descent. As is usual in these cases, a small knuckle of intestine accompanied the mass of omentum.

DR. WILLIAM HUNT said that in these cases some time must elapse to decide whether the cure is permanent. There is no doubt about the dense and strong union of *serous* surfaces, and based upon this, he made a suggestion as to a radical cure for hernia. He did not know whether it was new or had ever been tried. In these days of laparotomy upon both sexes, it is reasonable to suppose that a patient might come under the surgeon's hands who is at the same time a subject of hernia. Let the surgeon then take the opportunity of pulling the hernia in from the inside and stitch the broad serous surfaces at the hernial opening together, taking care of the cord, if the hernia is at that point. The result might develop whether it would be justifiable to do this operation for its own sake.

DR. C. B. NANCREDE thought that in these operations for the radical cure of hernia, it would be advisable to unite the parts with something that will remain permanently, such as silkworm-gut. This is non-absorbent and non-absorbable. A few months ago, in operating for a ventral hernia, where it would have been impossible to get anything like a plug of inflammatory matter, he closed the opening with three silkworm-gut sutures. The result was perfect. He thought this would be better than simply trusting to deposit of inflammatory matter.

In regard to the use of a truss after these operations, there was published some six months ago a *résumé* of a large number of operations, and the conclusion reached was that a truss had better be dispensed with.

DR. R. J. LEVIS said that as far back as twenty years ago the operation for the radical cure of hernia was quite a subject of discussion. He performed quite a number of operations by the invagination plan, in which peculiar instruments were employed. All of these cases proved failures. In this operation a plug from the surrounding tissue, perhaps the size of the end of a finger, was introduced into the ring and the plug closed in. He also operated in other ways, employing both the operation of Wutzer, Wood, and of McDougal. Our operations are now performed on a different plan. If there were any difficulty in bringing the columns of the ring together, he did not see any objection to freeing them from their lateral attachments in order that they may be approximated. His confidence would be in some means of holding the parts together until united.

DR. MEARS said that operations for hernia have taken a new departure since the work of Macewen and of Ball, of Dublin. He thought that we may now say that our operative work in regard to hernia is almost perfect, whether we adopt the method of Macewen or that which he carried out in this case. In a case presented to the Academy recently, and operated on by Macewen's method, in which the ring was carefully sutured, the hernia returned. What is needed and what is endeavored to be accomplished by the injection of infusion of oak bark in Heaton's method, is a mass of lymph to plug the opening and form a barrier to the descent of the hernia. Macewen plugs up the opening by tucking up the sac. In the method employed in this patient, the important point is to pull the sac down until you get that which is loose, and the finger may be used to loosen it around the ring. Then by transfixing this and fastening it in the opening a plug is secured. Different views have been entertained as to the advisability of removing the redundant portion of the sac or allowing it to remain. In the case presented, the hernia being congenital, the lower part of the sac was allowed to remain, forming a tunica vaginalis.

In this case he directed the patient to wear a Spica bandage with a compress after the operation. A truss, especially where it makes strong pressure, has a tendency to cause absorption of the inflammatory mass. All that is required is a simple support for a short time. This may be furnished either by a light truss with a broad pad or by a bandage.

MONTREAL MEDICO-CHIRURGICAL SOCIETY.

Stated Meeting, October 19, 1888.

THE PRESIDENT, WILLIAM GARDNER, M.D., IN THE CHAIR.

DRS. GEORGE ROSS and F. J. SHEPHERD reported a case of

PERFORATING APPENDICITIS

in which laparotomy was performed.

DR. ROSS gave the following history of the case: On the 4th inst., first saw the patient in consultation with his attending physician, who had first visited him three days previously. The patient was a healthy lad, aged seventeen. He had always enjoyed good health with the exception of some three or four attacks of so-called colic which had occurred within the past two years. These attacks were all very similar, and consisted of a somewhat sudden pain in the lower part of the abdomen and in the *left* side, not very severe and always soon relieved by a hot application and a mild anodyne. The attacks were attended by vomiting. The following day a dose of castor oil was given, and then the boy appeared quite well again. He was never away from his work on account of these attacks for more than two days. In the

intervals he suffered from no digestive disturbance of any kind, the fecal evacuations being quite normal.

Early in the morning of the first he awoke suffering from violent pain across the belly, chiefly in the middle zone and toward the *left* iliac fossa. Vomiting soon came on and was several times repeated during the day. The attack was looked upon as similar to those previously suffered from and was treated in the same way. Opium and poultices were prescribed by the medical attendant.

Dr. Ross first saw the patient four days later. At that time the face had the characteristic abdominal expression, but was not specially anxious-looking. Color good. He complained of great pain in the lower part of the abdomen and on the *left* side; no pain on right side. Flatulence was considerable and the belly was moderately distended, chiefly in its lower half; parietes very firm and resisting; tenderness not great, but well marked, chiefly in the hypogastric, umbilical, and *left* iliac regions. Pressure was better borne in the right iliac fossa than in almost any other part, and palpation of that region failed to detect any deep-seated fulness or resistance. Vomiting was frequent. The evening previous the bowels had been moved by an enema. Pulse 120 and weak, temperature 98°.

The diagnosis lay between an acute obstruction and an acute peritonitis, the latter view being favored by Dr. Ross. The cause of the peritonitis was the difficult point to decide; the sudden onset and rapid progress of the case suggested perforating appendicitis, and this was considered probable. The history gave some support to this idea, the difficulty being that the pain had always been referred to the left side, and on this side was also the greatest degree of tenderness. The ultimate diagnosis was acute purulent peritonitis depending on some previous disease in the lower part of the abdomen and that this might be an appendicitis, but the evidence on this point was inconclusive.

Dr. Ross gave it as his opinion that the boy would not live twenty-four hours if unrelieved, and strongly advised laparotomy. He fully realized the fact that four days had already elapsed and that the peritonitis was very extensive, and that in consequence the chances of relief by operation was very small. The boy was removed to the General Hospital and, after consultation with Drs. Shepherd and Bed, laparotomy was decided on.

DR. SHEPHERD said that when he saw the case with Dr. Ross, the patient was in a very helpless condition; he had a pulse of 150 and of much volume; vomiting was continuous. There was no tenderness on deep pressure in the iliac region, nor was there any fulness. The only very painful point was a little below and to the left of the umbilicus. It was decided to give the patient the very small chance offered by operation.

An incision some two inches long was made in the median line below the umbilicus and two fingers introduced; nothing could be felt but distended intestines, and the cæcum could not be reached, so the incision was enlarged and the hand introduced; no collapsed intestine could be felt, but quantities of lymph covered the intestines, and some fetid pus escaped from the wound; the left iliac region was explored, the appendix was felt hanging over the brim of the pelvis, and was apparently normal, though somewhat distended. For purposes of further exploration some of the intestines were drawn out of the abdomen and the cavity washed out with hot water. A large quantity of pus and lymph was evacuated from the bottom of the pelvis. In order to return the distended intestine an incision was made in it to allow the gas to escape; this incision was closed by Lembert sutures. The abdominal wound was now closed, a glass drainage tube being left at the lower end. At the end of the operation the boy was much collapsed and his pulse had failed markedly. He rallied somewhat but died next morning. After the operation there was no more vomiting.

An autopsy was made by Dr. Lafleur, who found that the cause of peritonitis was a perforation of the appendix. This appendix was found hanging over the brim of the pelvis, and it was in a gangrenous condition. It was folded up on itself, the perforation was situated within the fold and could not be seen until the parts were dissected out; to the feel, the appendix was normal. There was a great quantity of lymph on the intestines, and in the true pelvis the folds of intestines were glued together in every direction.

Dr. Shepherd remarked that, although he had examined the appendix at the time of the operation with his fingers he had not seen it, and that this case taught him that in cases of general peritonitis the appendix should always be examined by sight, even if the history and symptoms of the case do not point to this part as being the origin of the affection. If the cæcum and appendix cannot be brought to the surface at the median incision, they should be examined through an incision made in the left iliac fossa. The position of the appendix, viz., pendent in the cavity of the pelvis, explained in this case the absence of local symptoms; although the pelvis was examined before operation per rectum, nothing was made out. Dr. Shepherd also remarked that in these cases of perforating appendicitis in which the peritonitis was diffuse from the first operation, gave much less hope of cure than when there was from the outset a distinctively localized area of inflammation, characterized by the existence of a tumor.

DR. ROSS urged strongly the importance of early laparotomy in these cases, and said that operation should not be postponed beyond the third day. In this case, operation was not undertaken until the end of the fourth day, and consequently but little good could be expected from it.

DR. RODDICK asked Dr. Shepherd whether, if he had recognized the lesion in the appendix, he would have excised it, and would the result have been different.

DR. MILLS said that the position of the appendix was peculiar and might have caused a diminished circulation and finally strangulation; there was no doubt that the position favored the necrotic process.

In reply to Dr. Roddick, DR. SHEPHERD said that if he had made out the gangrenous condition of the appendix he would have excised it, but that he did not think this would have had any influence on the result.

DR. HARVEY, of Calcutta, made a few remarks on the objections to laparotomy prevalent among the natives of India, and said that it was very rare to get a native to consent to any new operation. He related a case which had come under his observation, of perforation of the appendix due to a lemon seed.

DR. WM. GARDNER related a case in which he had lately performed

ABDOMINAL SECTION

at the request of Drs. Rodger and England. The patient was a lad aged sixteen, who suffered from severe abdominal pain and vomiting a few days before; this was relieved by morphia, and in a day or two he was able to return to his work. When seen by Dr. Gardner he had very severe abdominal pain, vomiting, constipation, and marked distention of the abdomen. There was also an elastic swelling the size of a duck's egg in the region of the right inguinal canal. On examining the scrotum only one testicle (the left) was found. There had been a suspicion of strangulation with peritonitis, and the patient had been put under ether without result. So it was decided to open the abdomen, and this was accordingly done.

An incision was made long enough to admit two fingers; on incising the peritoneum a quantity of turbid serum escaped. All the ordinary hernia regions were examined and nothing found. The swelling in the inguinal canal was in the abdominal wall and extra-peritoneal; nothing else being found, the wound was closed.

The symptoms were much relieved for three or four days, then the abdominal distention began to increase and became very marked on the eighth day. However, the bowels began to act freely and the boy rapidly recovered, and was now quite well; the swelling in the groin had completely disappeared.

DR. BELL exhibited specimens from a

CASE OF SEVERE SYPHILIS

which had died from tuberculosis of the lung. The syphilitic disease in this case was very destructive, causing extensive ulceration of palate and larynx. The nose had disappeared. In the brain were spots of softening, due probably to thrombosis. The patient first contracted syphilis in 1886, and never commenced treatment until 1888.

DR. RODDICK exhibited two specimens of

CANCER OF THE LOWER JAW.

The first had occurred in a man aged forty-five. The growth commenced in the gum near the first molar tooth some months before, and rapidly spread to the bone and cheek. Half the lower jaw and a portion of the cheek were removed. The glands were only slightly enlarged and not infiltrated; the growth was epithelioma.

The second case occurred in a man aged sixty-five. The disease first appeared on the lower lip some eighteen months before, and rapidly involved all the soft tissues as far as the chin; the growth was adherent to the bone and of great density and hardness. The affection was never painful. The submaxillary lymphatic glands were involved. The growth and the portion of lower jaw to which it was adherent were removed. The growth proved to be epithelioma.

EXCISION OF KIDNEY.

DR. GARDNER exhibited a tumor, which he believed to be the left kidney, removed some days before by abdominal section from an unmarried woman of twenty-eight years, who had first noticed the tumor two and a half years previously. It had grown slowly, and had been moderately painful. On examination it appeared to be the size of a child's head, was hard, nodular, painless, and was so movable that it could be shifted to any part of the abdominal cavity from its ordinary position on the left side. When the patient was on her back the lower end of the tumor could be felt through the vagina. It could not be felt or pressed into the left lumbar region. Percussion showed it to be surrounded by intestine. The tympanitic note over it was unmistakable in the left loin. The patient was watched for eight days before operation. Pus was constantly present in the urine; she had night-sweats, but no rise of temperature.

At the operation the tumor was found to be behind the mesocolon, and the descending colon was over its outer aspect. The peritoneum over the tumor was incised, and the tumor was then easily shelled out. The attachments were at its upper end, and seemed to be the blood-vessels and ureter. The operation was completed by gathering the edges of the capsule together, and including them in the abdominal sutures. A glass drainage tube was inserted at the lower end of the wound; this was removed at the end of forty-eight hours. Her progress was uneventful, and now, at the ninth day, recovery is assured.

The tumor on section was found to be moderately firm, the surface grayish-white and fibrous. The growth was loculated; some loculi contained pus, others a yellowish transparent fluid. Urine was secreted plentifully from the first; the first two specimens contained blood, but no pus; since then there had been a little pus in the urine. Dr. Gardner thought that the absence of pus from the urine after the operation was conclusive evidence that the tumor was the kidney.

DR. RODDICK asked Dr. Gardner whether he would have performed the median incision if the diagnosis of kidney tumor had been made before operation.

DR. SMITH congratulated Dr. Gardner on the success of this operation, and said he was glad to see the gynecologist wresting further territory from the surgeon.

DR. SHEPHERD asked Dr. Gardner if it was not usual, in cases of removal of kidney by median abdominal incision, to drain through the loin. From the description given by the reader of the paper, the kidney removed appeared rather an anomalous one. All the vessels entered its upper end, and the ureter could not be distinctly made out. The tumor, if kidney, was apparently functionless.

DR. GARDNER, in reply, said that for such a tumor the abdominal incision was the best, the tumor was so movable and it could not be felt at all from the lumbar region. He was aware that some surgeons recommended draining through the loin in such cases, but he thought where the enveloping peritoneum was so loose, as in this case, and could so easily be brought to the surface and drained through the abdominal wound, the method adopted by him was preferable. He had handed the tumor over to Dr. Lafleur for examination and report.

DR. RUTTAN exhibited for Dr. deW. Smith, of British Columbia,

A LARGE GALL-STONE

which had been removed from the intestines after death, having produced fatal obstruction. The stone must have ulcerated through the gall-bladder into the duodenum as its size precluded the possibility of its passing successfully through the common duct. There had been no previous history of gall-stone.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, October 10, 1888.

THE PRESIDENT, J. SOLIS-COHEN, M.D., IN THE CHAIR.

DR. JAMES K. YOUNG exhibited the

MORTON OPHTHALMOSCOPE,

which presents some new features of interest. It is made by Pickard & Curry, London, and as an instrument is well balanced, fits the eye well, and as a piece of mechanism is perfection itself. It is a modification of the Gower's ophthalmoscope, as are all modern English instruments, but in the position and movement of the lenses differs from this and all others. The Rekoss disk is there replaced by an elliptical trough containing the lenses. These are simply confined in the channel, are unattached to each other, and are moved by a wheel below, and pass around a wheel above.

In this respect it resembles the Couper instrument, in which the lenses are attached to one another as an endless chain, but is an improvement in the right direction. It has, in all, thirty-three lenses. In the trough are eighteen concave lenses from —0.5 to 30 D. Eleven convex lenses from + 0.5 to 12 D., and on the disk has four additional lenses, a — 10 D. and — 50 D., and a + 0.5 and + 20 D. These admit of as many combinations as any instrument he was familiar with.

It has three mirrors, a small concave mirror of about 6 cm. focal length, fastened io a collar, a large concave mirror of about 29 cm. focal length, and a plane one. These are all attached, and the apertures come readily over the sight-hole. It has below the index dial a pupillometer, which adds to the usefulness of the instrument. It fits accurately into a rosewood case, and has a convex lens for the indirect method.

NEWS ITEMS.

The Origin of the Yellow Fever Epidemic.—At the meeting of the Virginia State Medical Society, held at Norfolk last week, Surgeon-General Hamilton, of the Marine-Hospital Service, gave the following account of the manner in which the now-prevailing epidemic of yellow fever was introduced into this country, the details of which, he said, had been secured at great cost to the Government and which have not as yet been published:

Last year the yellow fever appeared in Key West in the family of a restaurant keeper by the name of Baker. It appears that a family of Bolios, who had kept a hotel in Havana in various places, the last being called the Quinta-Avenida (Fifth Avenue) Hotel, unfortunately for Florida, emigrated to Key West. Their household effects, under the regulations governing the regular line of steamers, could not be shipped by them, so they shipped these effects, consisting of bedding and various articles of furniture, by an irregular "tramp," not now running, called the "Cochran." There was no objection officially made at Key West, as there was neither Government nor local quarantine, and the articles were landed and stored above Baker's restaurant. The Baker family died of the fever, and thus the fever started, and rapidly became epidemic.

The Government, under the operation of that section of the statutes forbidding interference with local authorities, did nothing except that, on request of the Governor to aid the local board, they established a dispensary and paid the expenses of the city hospital. To assist in the speedy depopulation of the city a refuge camp was established at Egmont Key, at the mouth of Tampa Bay. No case from Egmont communicated the disease. The first cases in Tampa were kept secret from August to October 21st. A family of Italians by the name of Turk, fruit-dealers, brought the fever into Tampa. The steamers had refused, under orders from the Hillsborough County Board of Health, to bring fruit from Havana or Key West. These Italians finding it impossible to continue in business, set up a smuggling line and brought fruit by way of Punta Gorda Bay and overland to Tampa. For this purpose the man Turk and his assistant Peep, or "Pete," made frequent surreptitious visits to Key West while the disease was there epidemic, and blankets were purchased in the infected city and used while on the overland trip, and brought to Tampa. It is a significant fact that the whole family of the Italians were the first taken sick, and that they were not publicly known to have been out of the town, although the fact is now known. The measures taken by the Government were simply to conform to the wishes of the Governor to aid the Hillsborough County Board of Health.

The duty of preventing the spread of the disease was undertaken by the Florida State Protective Association, an organization consisting of one representative from each County Board of Health, under the presidency of Dr. King Wyley, of Sandford. In December the Association raised the quarantine against Tampa. The County Board of Health asserted that the disease had disappeared, but unfortunately the disease had not been stamped out, and although the cases of fever lingered all winter in Tampa, its existence there was bitterly denied. From Tampa the disease spread to Plant City, Manatee, and other places, and it is now believed that the fever was at Jacksonville as early as February, Dr. Guitéras, of the Marine-Hospital Service, an acknowledged expert, says that in his judgment at least two of the cases of "society" fever, of which there were over thirty reported in Jacksonville in that month, had the well-marked clinical history of yellow fever. Nine of these cases died. Dr. Potts treated cases in Bay Street in June, and there were probably cases continuously until the formal announcement was made. He said that so-called isolated cases had been reported at Jacksonville after the case in Bay Street had been treated in June by Dr. Potts, but that the local authorities denied the presence of an epidemic, and placed a guard around each case. This state of things existed until August 16th, when the spread of the disease in Jacksonville became so great, cases springing up at various points in the city, that could not be traced to any of the so-called isolated cases, that the authorities had to declare the disease epidemic.

Dr. Hamilton said that the disease had been introduced in Decatur, Ala., by a man who had gone from Jacksonville while all of the cases in that city had been reported under guard. His ticket had been from some point outside of the infected city, and consequently he was not denied admittance. The doctor said the fever had been introduced into Gainesville and Fernandina by baseball players, who had played a game of ball in Jacksonville before the epidemic nature of the disease had been declared, and then returned to these cities.

Dr. Hamilton went on to explain the Government work at Camp Perry, and said that since its establishment there had been only one death from yellow fever in the fever hospital at the camp. He said that the experience of the physicians at the camp went to show that five days was the incubative period, and that when persons had been in the camp for that length of time and did not develop the disease, there was no danger of their having it. No person having spent ten days in the camp had developed the fever after leaving the station.

He spoke of the lack of local inspection at Tampa, where the disease first appeared this season, and said that if the first cases had been reported there would probably have been no epidemic, and he also said that he had proof to show that when the case of McCormack was reported as the first in Jacksonville, that the fever was then epidemic.

He also stated that while the fever was raging at Key West he, at the request of several health officers, had prepared a bill providing for the establishment of a State Board of Health, but it was laid on the table by the Florida Legislature through motives of false economy. He concluded by saying that the inspection of Florida cities, ordered by the Government, had developed the fact that the yellow fever was epidemic in both Enterprise and Fernandina.

Fatal Accident to a Physician.—Dr. R. Leonard, of Mauch Chunk, a prominent physician of Carbon County, while walking home from a visit to a patient, early on the morning of the 26th ult., was struck by a passing train and killed. Dr. Leonard was active in the local medical societies, was President of the Lehigh Valley Medical Association in 1884, and a member of both the State and National Society.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF OFFICERS SERVING IN THE MEDICAL DEPARTMENT, U. S. ARMY, FROM OCTOBER 30 TO NOVEMBER 5, 1888.

BAILEY, ELISHA J., *Colonel and Surgeon.*—Detailed for duty on the Army Retiring Board, to meet at San Francisco, California, for the examination of such officers as may be ordered before it.—Par. 3, *S. O. 253, A. G. O., Washington*, October 30, 1888.

COCHRAN, JOHN J., *Captain and Assistant Surgeon.*—Detailed for duty on Army Retiring Board, to meet in San Francisco, California, for the examination of such officers as may be ordered before it.—Par. 3, *S. O. 253, A.G. O., Washington*, October 30, 1888.

NORRIS, BASIL, *Lieutenant and Assistant Surgeon.*—Will be relieved from duty in the Department of the Columbia, by the commanding general of that Department, and will report in person on or before November 14, 1888, to the commanding general Division of the Pacific, for duty as Medical Director of that Division and of the Department of California.—Par. 14, *S. O. 255, A. G. O., Washington*, November 1, 1888.

By direction of the Secretary of War, EDWARD P. VOLLUM, *Lieutenant-Colonel and Surgeon*, on being relieved from duty as Medical Director Department of Texas, by Lieutenant-Colonel Joseph C. Baily, Assistant Medical Purveyor, under War Department Order dated October 31, 1888, S. O. 255, A. G. O., will repair to New York City, assume the duties of Acting Assistant Medical Purveyor, and take charge of the medical purveying department at that place.—Par. 2, *S. O. 255, A. G. O., Washington*, November 1, 1888.

ALEXANDER CHARLES T., *Lieutenant-Colonel and Surgeon.*—Is relieved from further duty in the Department of Dakota, and will report in person to the commanding general Department of the Columbia, for duty as Medical Director of that Department.—Par. 14, *S. O. 255, A. G. O., Washington*, November 1, 1888.

BAILY, JOSEPH C., *Lieutenant-Colonel and Assistant Medical Purveyor.*—Is, at his own request, relieved from the charge of the medical purveying depot in New York City, and is, by direction of the President, under the provisions of the Act of Congress approved June 23, 1874, assigned to duty as Surgeon in the Medical Department. He will report in person to the commanding general Department of Texas, for assignment to duty as Medical Director of that Department, to relieve Lieutenant-Colonel and Surgeon E. P. Vollum.—Par. 1, *S. O. 255, A. G. O., Washington*, November 1, 1888.

By direction of the Secretary of War, leave of absence for two months, to take effect on the completion of his present duties, is granted to HENRY MCELDERY, *Major and Surgeon* (U. S. Army).—Par. 3, *S. O. 256, A. G. O., Washington, D. C.*, November 2, 1888.

WEISER, DANIEL, *Captain and Assistant Surgeon* (U. S. Army).—Died at Fort Sill, Indian Territory, October 30, 1888.

HOFF, J. VAN R., *Captain and Assistant Surgeon.*—Is granted leave of absence for one month, with permission to apply for an extension of one month.—*S. O. 134, Headquarters Department of the Missouri, Fort Leavenworth, Kansas*, November 1, 1888.

By direction of the Secretary of War, JOHN J. COCHRAN, *Captain and Assistant Surgeon*, is relieved from temporary duty at Headquarters Division of the Pacific, and will report in person to the commanding officer Fort Adams, Rhode Island, for duty at that post.—Par. 2, *S. O. 256, A. G. O., Washington*, November 2, 1888.

By direction of the Secretary of War, NORTON STRONG, *Captain and Assistant Surgeon*, is relieved from duty in the Department of Arizona, and will report in person to the commanding officer Fort Schuyler, New York, for duty at that post, and by letter to the commanding general Division of the Atlantic.—Par. 4, *S. O. 255, A. G. O., Washington*, November 1, 1888.

OWEN, W. O., Jr., *Captain and Assistant Surgeon* (Fort Leavenworth, Kansas).—Will proceed at once to Fort Sill, Indian Territory, and report to the commanding officer, for temporary duty at that post.—Par. 1, *S O. 133, Headquarters Department of the Missouri, Fort Leavenworth, Kansas*, October 30, 1888.

GLENNAN, JAMES D.—Appointed Assistant Surgeon (U. S. Army), with rank of First Lieutenant, to rank from October 29, 1888.

BRADLEY, ALFRED E.—Appointed Assistant Surgeon (U. S. Army), with rank of First Lieutenant, to rank from October 29, 1888.

By direction of the Secretary of War, JAMES D. GLENNAN, *First Lieutenant and Assistant Surgeon*, recently appointed, will repair from this city to Willett's Point, New York, and report in person to the commanding officer of that post for duty.—Par. 3, *S. O. 255, A. G. O., Washington*, November 1, 1888.

OFFICIAL LIST OF CHANGES IN THE STATIONS AND DUTIES OF THE MEDICAL CORPS OF THE U. S. NAVY, FOR THE WEEK ENDING NOVEMBER 3, 1888.

GIHON, A. L., *Medical Director.*—Ordered to Naval Hospital, Brooklyn, New York.

TAYLOR, JOHN Y., *Medical Director.*—Detached from Naval Hospital, New York, and ordered to Examining Board.

HUDSON, ADRIAN, *Medical Inspector.*—Promoted to Medical Director.

BRADLEY, MICHAEL, *Medical Inspector.*—Promoted to Medical Director.

BATES, NEWTON L., *Medical Inspector.*—Promoted to Medical Director.

WOOLVERTON, I., *Surgeon.*—Promoted to Medical Inspector.

WHITE, C. H., *Surgeon.*—Promoted to Medical Inspector.

WOODS, G. W., *Surgeon.*—Promoted to Medical Inspector.

DUBOIS, F. L., *Surgeon.*—Promoted to Medical Inspector.

COOKE, G. H., *Surgeon.*—Promoted to Medical Inspector.

WELLS, HOWARD, *Passed Assistant Surgeon.*—Premoted to Surgeon.

BERTOLETTE, D. N., *Passed Assistant Surgeon.*—Promoted to Surgeon.

GAINES, J. H., *Passed Assistant Surgeon.*—Promoted to Surgeon.

DERR, EZRA J., *Passed Assistant Surgeon.*—Promoted to Surgeon.

STEPHENSON, F. B., *Passed Assistant Surgeon*—Promoted to Surgeon.